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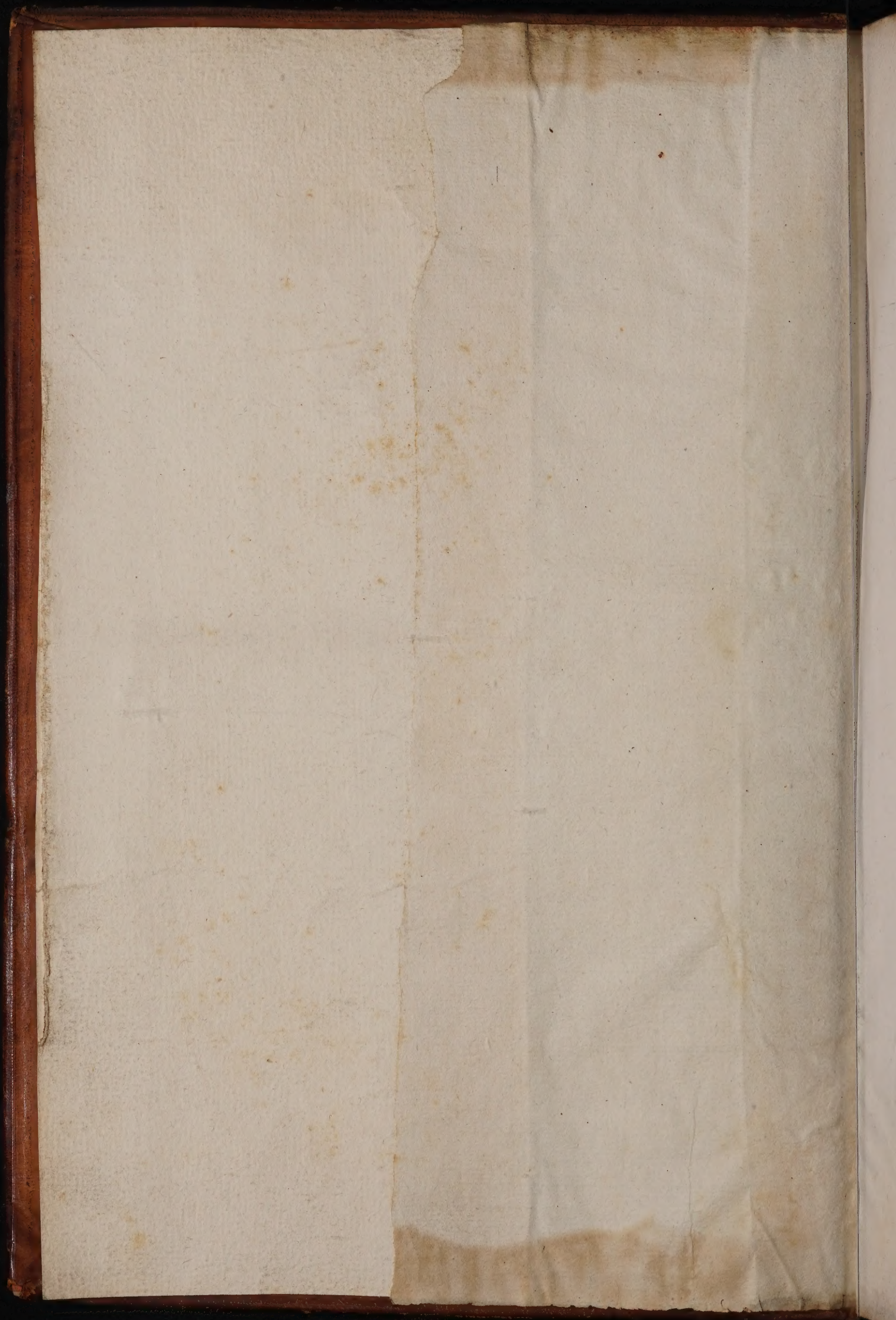
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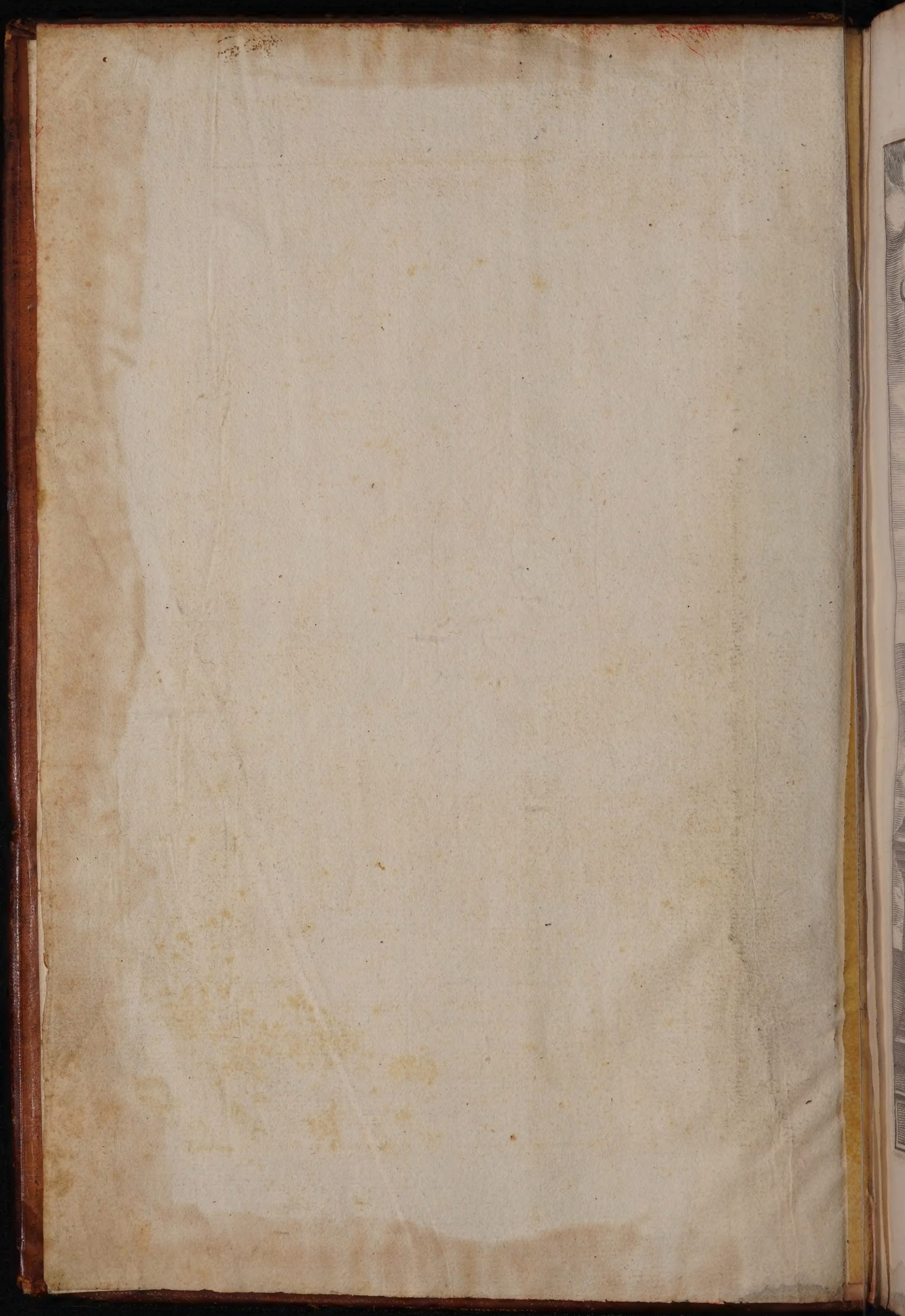






















S Y L V A  
S Y L V A R V M :

OR,  
A Naturall Historie.

I N T E N C E N T V R I E S.

VV R I T T E N B Y T H E R I G H T  
*Honourable FRANCIS LO. Verulam*  
Viscount S<sup>r</sup> A L B A N.

Published after the Authors death,  
B Y W I L L I A M R A V V L E Y *Doctor in Divinity,*  
*one of his Majesties Chaplaines.*

Hereunto is now added an Alphabeticall Table of the prin-  
cipall things contained in the whole Worke.

*The fifth Edition.*



L O N D O N,  
Printed by John Haviland, for William Lee, and  
are to be sold at the Great *Turks* Head next to the Mitre  
Taverne in *Fleetstreet*. 1639.



SYLVARVM  
OR  
ANATURAL HISTORIE

IN TEN CE VLTIMIS

VRITTEN BY THE RIGHT  
Honorable FRANCIS D. VERULAM  
Viscount of BUCKINGHAM

Published after the Authors death  
BY WILLIAM RAVLEY Doctor in Divinity  
one of his Majesties Chaplains

Hereto is now added an Alphabetical Table of the  
chief things contained in the whole 10 parts

The Fifth Edition



L O N D O N  
Printed by John Hawland, for William I. and  
are to be sold at the Great Turk Head next to the  
Tavern in Fleet Street. 1652.





TO THE MOST HIGH  
AND MIGHTY PRINCE  
CHARLES,

BY THE GRACE OF GOD,  
King of *Great Britaine, France, and*  
*Ireland, Defender of the Faith, &c.*

*May it please your most Excellent Majestie ;*

**T**He whole Body of the *Naturall History*, either designed or written, by the late *Lord Viscount S. Alban*, was dedicated to your *Majestie*, in his Booke *De Ventis*, about foure yeares past, when your *Majestie* was *Prince* : So as there needed no new Dedication of this *Worke*, but onely in all humbleness, to let your *Majestie* know, it is yours. It is true; if that *Lord* had lived, your *Majestie*, ere long, had beene invoked, to the Protection of another *History*; whereof, not *Natures Kingdome*, as in this, but these of your *Majesties*,  
A 2 (during



*The Epistle Dedicatory.*

(during the Time and *Raigne* of King Henry the *Eighth*) had beene the Subject: Which since it died under the Designation meerely, there is nothing left, but your *Majesties* Princely Goodnesse, graciously to accept of the Vndertakers Heart, and Intentions; who was willing to have parted, for a vvhile, vvith his Darling *Philosophie*, that he might have attended your Royall Commandement, in that other *Worke*. Thus much I have beene bold, in all lowlineffe, to represent unto your *Majestie*, as one that vvvas trusted vvith his *Lordships* *Writings*, even to the last. And as this *Worke* affecteth the *Stampe* of your *Majesties* Royall *Protection*, to make it more currant to the *World*; So under the *Protection* of this *Worke*, I presume in all humblenessse to approach your *Majesties* presence; And to offer it up into your *Sacred Hands*.

*Your MAIESTIE Smost Loyall*

*and Devoted Subject,*

---

VV. RAVVLEY.





## To the Reader.



AVING had the Honour to be continually with my *Lord*, in compiling of this *Worke*; And to be employed therein; I have thought it not amisse, (with his Lordships good leave and liking,) for the better satisfaction of those that shall reade it, to make knowne somewhat of his Lordships Intentions, touching the Ordering, and Publishing of the same. I have heard his Lordship often say; that if he should have served the glory of his own Name, he had been better not to have published this *Naturall History*: For it may seeme an Indigested Heap of Particulars; And cannot have that Lustre, which Bookes cast into Methods have: But that he resolved to preferre the good of Men, and that which might best secure it, before any thing that might have Relation to Himselfe. And he knew well, that there was no other vvay open, to unloose Mens mindes, being bound; and (as it were) Maleficiate, by the Charmes of deceiving Notions, and Theories; and thereby made Impotent for Generation of Workes; But onely no where to depart from the Sense, and cleare experience; But to keepe close to it, especially in the beginning: Besides, this *Naturall History* was a Debt of his, being designed and set down for a third part of the *Instauration*. I have also heard his Lordship discourse, that Men (no doubt) will thinke many of the *Experiments* contained in this Collection, to be Vulgar and Triviall: Meane and Sordid; Curious and Fruitlesse: And therefore he wisheth, that they would have perpetually before their Eyes, what is now in doing: And the difference between this *Naturall Historie*, and others. For those *Naturall Histories*; which are Extant, being gathered for De-



those that are rendered by Others; Not for any Excellency of his  
 owne Wit (as his Lordship is wont to say) but in respect of  
 his continuall Conversation with Nature; and Experience. He  
 did consider likewise, that by this addition of Cases, many  
 minds (which make so much haste to finde out the Cases of  
 things;) would not think themselves utterly lost in a vast  
 wood of Experiments, but lay upon these Cases; (such as they  
 are, a little illuminated) may be more fully discovered. I  
 have heard his Lordship say also, that one great reason why he  
 would not put these Particulars into any exact Method,  
 (though he that looks attentively into them, shall finde that  
 they have a secret Order) was because he conceived that other  
 men would now think that they could doe the like; And so  
 go on with a further Collection: which if the Method had been  
 Exact, many would have despised to attaine by Imitation. As  
 for his Lordships love of Order, I can testify any Man to his  
 Lordships Examine Booke, De Natura Scientiarum, which (if  
 my Iudgement be any thing) is written in the Exactest Order.  
 that I know any Writing to be. I will conclude with an usual  
 speech of his Lordships. That his VVork of his Natural Phi-  
 losophy is the Word, as GOD made it; and not as Men have  
 made it; for that is but nothing of Imagination.

This Epistle  
 is the same  
 that is in the  
 first Edition  
 have been  
 printed to  
 this Booke  
 his Lordship  
 had lived.

W. Brouncker.



# A TABLE OF the Experiments.

## Century I.



|                                                                         |            |
|-------------------------------------------------------------------------|------------|
| <i>F</i> Straining or Percolation, Outward and inward: Experiments 8.   | page 1     |
| <i>O</i> f Motion upon Pressure. Experiments 5.                         | page 2     |
| <i>O</i> f Separations of Bodies Liquid by weight. Exper. 3.            | pag. 3     |
| <i>O</i> f Infusions, in Water and Aire. Exper. 7.                      | pag. 4     |
| <i>O</i> f the Appetite of Continuation in Liquids. Exper. 1.           | pag. 5     |
| <i>O</i> f Artificiall Springs. Exp. 1.                                 | pag. 6     |
| <i>O</i> f the Venemous Qualitie of Mans flesh. Exp. 1.                 | ibid.      |
| <i>O</i> f Turning Aire into Water. Exp. 1.                             | ibid.      |
| <i>O</i> f Helping or Altering the Shape of the Body. Exp. 1.           | pag. 7     |
| <i>O</i> f Condensing of Aire, to yeeld Weight, or Nourishment. Exp. 1. | ibid.      |
| <i>O</i> f Flame and Aire Commixed. Exp. 1.                             | pag. 8.    |
| <i>O</i> f the Secret Nature of Flame. Exp. 1.                          | pag. 9     |
| <i>O</i> f Flame, in the Midst, and on the Sides. Exp. 1.               | pag. ibid. |
| <i>O</i> f Motion of Gravity. Exp. 1.                                   | pag. 10    |
| <i>O</i> f Contraction of Bodies in Bulke. Exp. 1.                      | ibid.      |
| <i>O</i> f making Vines more fruitfull. Exp. 1.                         | ibid.      |
| <i>O</i> f the Severall operations of Purging Medicines. Exp. 9.        | ibid.      |
| <i>O</i> f Meats and Drinkes most Nourishing. Exp. 15.                  | pag. 12    |
| <i>O</i> f Medicines applied in Order. Exp. 1.                          | pag. 16    |
| <i>O</i> f Cure by Custome. Exp. 1.                                     | pag. 17    |
| <i>O</i> f Cure by Excesse. Exp. 1.                                     | ibid.      |
| <i>O</i> f Cure by Motion of Consent. Exp. 1.                           | ibid.      |
| <i>O</i> f Cure of Diseases contrary to Predisposition. Exp. 1.         | ibid.      |
| <i>O</i> f Preparation before and after Purging. Exp. 1.                | pag. 18    |
| <i>O</i> f Stanching Bloud. Exp. 1.                                     | ibid.      |
| <i>O</i> f Change of Aliments and Medicines. Exp. 1.                    | ibid.      |
| <i>O</i> f Diets. Exp. 1.                                               | pag. 19    |



## THE TABLE.

|                                                                   |         |
|-------------------------------------------------------------------|---------|
| Of Production of Cold. Exp. 7.                                    | pag. 19 |
| Of Turning Aire into Water. Exp. 7.                               | pag. 20 |
| Of Induration of Bodies. Exp. 8.                                  | pag. 22 |
| Of Preying of Aire upon Water. Exp. 1.                            | pag. 24 |
| Of the Force of Union. Ex. 1.                                     | ibid.   |
| Of Making Feathers and Haires of divers Colours. Exp. 1.          | ibid.   |
| Of Nourishment of Young Creatures, in the Egge, or Wombe. Exp. 1. | pag. 25 |
| Of Sympathy, and Antipathy. Exp. 3.                               | ibid.   |
| Of the Spirits, or Pneumaticalls in Bodies. Exp. 1.               | pag. 26 |
| Of the Power of Hear. Exp. 1.                                     | pag. 27 |
| Of Impossibilitie of Annihilation. Exp. 1.                        | pag. 28 |

## the Experiments. Century II.

|                                                               |         |
|---------------------------------------------------------------|---------|
| <b>O</b> f Musicke. Exp. 14.                                  | pag. 29 |
| Of the Nullity and Emity of Sounds. Exp. 9.                   | pag. 32 |
| Of Production, Conservation, and Delation of Sounds. Exp. 14. | pag. 34 |
| Of Magnitude, Exilitie, and Damps of Sounds. Exp. 25.         | pag. 37 |
| Of Lowdnesse, and Softnesse of Sounds. Exp. 3.                | pag. 41 |
| Of Communication of Sounds. Exp. 3.                           | ibid.   |
| Of Equalitie and Inequalitie of Sounds. Exp. 9.               | ibid.   |
| Of more Treble and Base Tones. Exp. 6.                        | pag. 43 |
| Of Proportion of Treble and Base. Exp. 4.                     | pag. 44 |
| Of Exterieur, Interiour Sounds. Exp. 4.                       | pag. 45 |
| Of Articulation of Sounds. Exp. 9.                            | pag. 46 |
| ibid.                                                         |         |
| ibid.                                                         |         |

## Century III.

|                                                                  |         |
|------------------------------------------------------------------|---------|
| <b>O</b> f the Lines in which Sounds move. Exp. 6.               | pag. 49 |
| Of the Lasting or Perishing of Sounds. Exp. 5.                   | pag. 50 |
| Of the Passage in Interception of Sounds. Exp. 5.                | pag. 51 |
| Of the Medium of Sounds. Exp. 4.                                 | pag. 52 |
| Of the Figures of Bodies yeelding Sounds. Exp. 3.                | ibid.   |
| Of Mixture of Sounds. Exp. 5.                                    | pag. 53 |
| Of Melioration of Sounds. Exp. 7.                                | pag. 54 |
| Of Imitation of Sounds. Exp. 6.                                  | pag. 55 |
| Of Reflexion of Sounds. Exp. 13.                                 | pag. 56 |
| Of Consent and Dissent betweene Audibles, and Visibles. Exp. 23. | pag. 58 |
| Of Sympathy and Antipathy of Sounds. Exp. 5.                     | pag. 61 |
| Of Hindering or Helping of Hearing. Exp. 4.                      | pag. 62 |
| Of the Spirituall and Fine Nature of Sounds. Exp. 4.             | pag. 63 |
| Of Orient Colours in Dissolutions of Metalls. Exp. 1.            | pag. 64 |



## THE TABLE.

|                                                                        |         |
|------------------------------------------------------------------------|---------|
| Of Prolongation of Life. Exp. i.                                       | pag. 64 |
| Of the Appetite of Union in Bodies. Exp. i.                            | ibid.   |
| Of the like Operations of Heat and Time. Exp. i.                       | pag. 65 |
| Of the Differing Operations of Fire and Time. Exp. i.                  | ibid.   |
| Of Motions by Imitation. Exp. i.                                       | ibid.   |
| Of Infectious Diseases. Exp. i.                                        | ibid.   |
| Of the Incorporation of Powders and Liquours. Exp. i.                  | ibid.   |
| Of Exercise of the Bodie; And the Benefits, or Evills thereof. Exp. i. | pag. 66 |
| Of Meats soone Glutting, or Not Glutting. Exp. i.                      | ibid.   |

## Century IV.

|                                                                                                    |         |
|----------------------------------------------------------------------------------------------------|---------|
| <b>O</b> f Clarification of Liquours, and the Accelerating thereof. Exp. ii.                       | pag. 67 |
| Of Maturation, and the Accelerating thereof; And of the Maturation of Drinks, and Fruits. Exp. i5. | pag. 69 |
| Of Making Gold. Exp. i.                                                                            | pag. 71 |
| Of the Severall Natures of Gold. Exp. i.                                                           | pag. 73 |
| Of Inducing and Accelerating Putrefaction. Ex. i2.                                                 | ibid.   |
| Of Prohibiting and Preventing Putrefaction. Exp. i.                                                | pag. 75 |
| Of Rotten Wood Shining. Exp. i.                                                                    | pag. 77 |
| Of Acceleration of Birth. Exp. i.                                                                  | pag. 78 |
| Of Acceleration of Growth and Stature. Exp. i.                                                     | ibid.   |
| Of Bodies Sulphureous and Mercuriall. Exp. 5.                                                      | ibid.   |
| Of the Chameleon. Exp. i.                                                                          | pag. 80 |
| Of Subterrany Fires. Exp. i.                                                                       | ibid.   |
| Of Nitrous Water.                                                                                  | ibid.   |
| Of Congealing of Aire. Exp. i.                                                                     | ibid.   |
| Of Congealing of Water into Christall. Exp. i.                                                     | pag. 81 |
| Of Preserving the Smell, and Colour, in Rose-Leaves. Exp. i.                                       | ibid.   |
| Of the Lasting of Flame. Exp. i0.                                                                  | ibid.   |
| Of Infusions or Burials of divers Bodies in Earth. Exp. 5.                                         | pag. 83 |
| Of the Affects of Mens Bodies from severall windes. Exp. i.                                        | pag. 84 |
| Of Winter and Summer Sickneses. Exp. i.                                                            | ibid.   |
| Of Pestilentiall Yeares. Exp. i.                                                                   | pag. 85 |
| Of Epidemicall Diseases. Exp. i.                                                                   | ibid.   |
| Of Preservation of Liquours in Wells, or deepe Vaults. Exp. i.                                     | ibid.   |
| Of Stunting. Exp. i.                                                                               | ibid.   |
| Of Sweet Smells. Exp. 4.                                                                           | pag. 86 |
| Of the Goodnesse, and Choice of Waters. Exp. 7.                                                    | ibid.   |
| Of Temperate Heats under the Equinoctiall. Exp. i.                                                 | pag. 87 |
| Of the Coloration of Black and Tawney Moores. Exp. i.                                              | ibid.   |
| Of Motion after the Instant of Death. Exp. i.                                                      | pag. 88 |



## THE TABLE.

### Century V.

|                                                                    |          |
|--------------------------------------------------------------------|----------|
| <b>O</b> F Accelerating or Hastening forward Germination. Exp. 12. | pag. 89  |
| Of Retarding or putting backe Germination. Exp. 9.                 | pag. 92  |
| Of Meliorating, or making better, Fruits, and Plants. Exp. 55.     | pag. 93  |
| Of Compound Fruits, and Flowers. Exp. 3.                           | pag. 100 |
| Of Sympathy and Antipathy of Planes. Exp. 19.                      | pag. 101 |
| Of Making Herbs and Fruits Medicinable. Exp. 2.                    | pag. 104 |

### Century V I.

|                                                                                          |           |
|------------------------------------------------------------------------------------------|-----------|
| <b>O</b> F Curiosities about Fruits, and Plants. Exp. 17.                                | pag. 107  |
| Of the Degenerating of Plants; And of their Transmutation one into another. Exp. 14.     | pag. 110. |
| Of the Procerity and Lownesse of Plants; And of Artificiall Dwarfing them. Exp. 5.       | pag. 138  |
| Of the Rudiments of Plants; And of the Excrescences of Plants, or Super-Plants. Exp. 26. | ibid.     |
| Of producing Perfect Plants without Seed. Exp. 11.                                       | pag. 117. |
| Of Forraine Plants. Exp. 3.                                                              | pag. 118  |
| Of the Seasons of severall Plants. Exp. 6.                                               | pag. 119  |
| Of the Lasting of Plants. Exp. 5.                                                        | pag. 120  |
| Of severall Figures of Plants. Exp. 3.                                                   | pag. 121  |
| Of some principall Differences in Plants. Exp. 4.                                        | ibid.     |
| Of all Manner of Composts and Helps for Ground. Exp. 6.                                  | pag. 122  |

### Century VII.

|                                                                                                                            |          |
|----------------------------------------------------------------------------------------------------------------------------|----------|
| <b>O</b> F the Affinities and Differences betweene Planes, and Bodies Inanimate. Exp. 6.                                   | pag. 125 |
| Of Affinities and differences betweene Plants, and Living Creatures; And of the Confiners and Participles of Both. Exp. 3. | pag. 126 |
| Of Plants Experiments Promiscuous. Exp. 67.                                                                                | pag. 127 |
| Of Healing of Wounds. Exp. 1.                                                                                              | pag. 139 |
| Of Fat diffused in Flesh. Exp. 1.                                                                                          | ibid.    |
| Of Ripening Drinke speedily. Exp. 1.                                                                                       | ibid.    |

Of



## THE TABLE.

|                                                                                |          |
|--------------------------------------------------------------------------------|----------|
| Of Pilositie and Plumage. Exp. 1.                                              | ibid.    |
| Of the Quicknesse of Motion in Birds. Exp. 1.                                  | ibid.    |
| Of the Clearnesse of the Sea, the North Winde blowing. Exp. 1.                 | ibid.    |
| Of the Different Heats of Fire and Boyling water. Exp. 1.                      | pag. 140 |
| Of the Qualification of Heat by Moisture. Exp. 1.                              | ibid.    |
| Of Raining. Exp. 1.                                                            | ibid.    |
| Of the Hiccough. Exp. 1.                                                       | ibid.    |
| Of Sneezing. Exp. 1.                                                           | ibid.    |
| Of the Tendernesse of the Teeth. Exp. 1.                                       | pag. 141 |
| Of the Tongue. Exp. 1.                                                         | ibid.    |
| Of the Mouth out of Taste. Exp. 1.                                             | ibid.    |
| Of some Prognosticks of Pestilentiall Seasons. Exp. 1.                         | ibid.    |
| Of Speciall Simples for Medicines. Exp. 1.                                     | ibid.    |
| Of Venus. Exp. 3.                                                              | pag. 142 |
| Of the Insecta, or Creatures bred of Putrefaction. Exp. 3.                     | pag. 143 |
| Of Leaping. Exp. 1.                                                            | pag. 145 |
| Of the Pleasures and Displeasures of Hearing, and of the other Senses. Exp. 1. | ibid.    |

## Century VIII.

|                                                                                |           |
|--------------------------------------------------------------------------------|-----------|
| <b>O</b> f Veines of Earth Medicinall. Exp. 1.                                 | pag. 147  |
| Of Sponges. Exp. 1.                                                            | ibid.     |
| Of Sea-Fish in Fresh waters. Exp. 1.                                           | ibid.     |
| Of Attraction by Similitude of Substance. Exp. 1.                              | pag. 148  |
| Of Certaine Drinks in Turkey. Exp. 1.                                          | ibid.     |
| Of Sweat. Exp. 6.                                                              | ibid.     |
| Of the Glo-worme. Exp. 1.                                                      | pag. 149  |
| Of the Impressions upon the Body, from severall Passions of the Minde. Ex. 10. | ibid.     |
| Of Drunkennesse. Exp. 4.                                                       | pag. 152. |
| Of the Hurt, or Helpe of Wine, taken moderately. Exp. 1.                       | pag. 153  |
| Of Caterpillers. Exp. 1.                                                       | ibid.     |
| Of the Flies Canibarides. Exp. 1.                                              | pag. 161  |
| Of Lassitude. Exp. 2.                                                          | pag. 154  |
| Of Casting the Skin, and Shell, in some Creatures. Exp. 1.                     | ibid.     |
| Of the Postures of the Body. Exp. 3.                                           | ibid.     |
| Of Pestilentiall Teares. Exp. 1.                                               | pag. 155  |
| Of some Prognosticks of Hard Winters. Exp. 1.                                  | ibid.     |
| Of certaine Medicines that condense and releve the Spirits. Exp. 1.            | ibid.     |
| Of paintings of the Body. Exp. 1.                                              | ibid.     |
| Of the Use of Bathing and Anointing. Exp. 1.                                   | pag. 156  |
| Of Chamoletting of Paper. Exp. 1.                                              | ibid.     |
| Of Cuttle-Inke. Exp. 1.                                                        | ibid.     |
| Of Earth increasing in Weight. Exp. 1.                                         | ibid.     |
| Of Sleepe. Exp. 3.                                                             | ibid.     |
| Of Teeth, and Hard Substances in the Bodies of Living Creatures. Exp. 11.      | pag. 157  |
| Of the Generation, and Bearing of Living Creatures in the Wombe. Ex. 3.        | pag. 159  |
| Of                                                                             |           |



## THE TABLE.

|                                                                                      |            |
|--------------------------------------------------------------------------------------|------------|
| Of Species Visible Exp. 2.                                                           | pag. 160   |
| Of Impulsion, and Percussion. Exp. 3.                                                | ibid.      |
| Of Tirillation. Exp. 1.                                                              | pag. 161   |
| Of Scarcity of Raine in Egypt. Exp. 1.                                               | ibid.      |
| Of Clarification. Exp. 1.                                                            | [ pag. 162 |
| Of Plants without Leaves. Exp. 1.                                                    | ibid.      |
| Of the Materialls of Glasse. Exp. 1.                                                 | ibid.      |
| Of Prohibition of Putrefaction, and the long Conservation of Bodies. Exp. 1.         | ibid.      |
| Of Abundance of Nitre in certaine Sea-Shores. Exp. 1.                                | pag. 163   |
| Of Bodies borne up by Water. Exp. 1.                                                 | ibid.      |
| Of Fuell consuming little or nothing. Exp. 1.                                        | ibid.      |
| Of Cheape Fuell. Exp. 1.                                                             | pag. 164   |
| Of Gathering of Winde for Freshnesse. Exp. 1.                                        | ibid.      |
| Of Trialls of Aires. Exp. 1.                                                         | ibid.      |
| Of Increasing Milke in Milke-Beasts. Exp. 1.                                         | ibid.      |
| Of Sand of the Nature of Glasse. Exp. 1.                                             | ibid.      |
| Of the Growth of Corall. Exp. 1.                                                     | pag. 165   |
| Of the Gathering of Manna. Exp. 1.                                                   | ibid.      |
| Of Correcting of Wines. Exp. 1.                                                      | ibid.      |
| Of Bitumen, one of the Materialls of wilde-Fire. Exp. 1.                             | ibid.      |
| Of Plaster growing as hard as Marble. Exp. 1.                                        | ibid.      |
| Of the Cure of some Vicers and Hurts. Exp. 1.                                        | pag. 166   |
| Of the Healthfulness or Unhealthfulness of the Southerne Winde. Exp. 1.              | ibid.      |
| Of Wounds made with Brasse, and with Iron. Exp. 1.                                   | ibid.      |
| Of Morrification by Cold. Exp. 1.                                                    | ibid.      |
| Of Weight. Exp. 1.                                                                   | ibid.      |
| Of Super-Natation of Bodies. Exp. 1.                                                 | ibid.      |
| Of the Flying of Vnequall Bodies in the Aire. Exp. 1.                                | pag. 167   |
| Of Water that it may be the Medium of Sounds. Exp. 1.                                | ibid.      |
| Of the Flight of the Spirits upon Odious Objects. Exp. 1.                            | ibid.      |
| Of the Super-Reflexion of Eccho's. Exp. 1.                                           | ibid.      |
| Of the Force of Imagination imitating that of the Sense. Exp. 1.                     | pag. 168   |
| Of Preservation of Bodies. Exp. 1.                                                   | ibid.      |
| Of the Growth, or Multiplying of Metalls. Exp. 1.                                    | ibid.      |
| Of the drowning the more base Metall in the more Precious. Exp. 1.                   | ibid.      |
| Of Fixation of Bodies. Exp. 1.                                                       | pag. 169   |
| Of the Restlesse Nature of Things in Themselves, and their Desire to Change. Exp. 1. | ibid.      |

## Century IX.

|                                                                                                  |          |
|--------------------------------------------------------------------------------------------------|----------|
| Of Perception in Bodies Insensible, tending to Naturall Divination, and Subtill Trialls Exp. 30. | pag. 171 |
| Of the Causes of Appetite in the Stomach. Exp. 1.                                                | pag. 176 |
| Of Sweetnesse of Odour from the Rain-Bow. Exp. 1.                                                | ibid.    |

of



# THE TABLE.

|                                                                       |          |
|-----------------------------------------------------------------------|----------|
| Of Sweet Smells. Exp. 1.                                              | pag. 177 |
| Of the Corporeall Substance of Smells. Exp. 1.                        | ibid.    |
| Of Fetide and Fragrant Odours. Exp. 1.                                | ibid.    |
| Of the Causes of Putrefaction. Exp. 1.                                | pag. 178 |
| Of Bodies unperfectly Mixt. Exp. 1.                                   | pag. 179 |
| Of Concoction and Cruditie. Exp. 1.                                   | ibid.    |
| Of Alterations, which may be called Maiors. Exp. 1.                   | ibid.    |
| Of Bodies Liquefiable, and not Liquefiable. Exp. 1.                   | pag. 180 |
| Of Bodies Fragile and Tough. Exp. 1.                                  | ibid.    |
| Of the two Kinds of Pneumaticalls in Bodies. Exp. 1.                  | pag. 181 |
| Of Concretion and Dissolution of Bodies. Exp. 1.                      | ibid.    |
| Of Bodies Hard and Soft. Exp. 1.                                      | ibid.    |
| Of Bodies Ductile, and Tenstile. Exp. 1.                              | ibid.    |
| Of Severall Passions of Matter, and Characters of Bodies. Exp. 1.     | pag. 182 |
| Of Iaturation by Sympathy. Exp. 1.                                    | ibid.    |
| Of Honey and Sugar. Exp. 1.                                           | pag. 183 |
| Of the Finer Sort of Base Mettalls. Exp. 1.                           | ibid.    |
| Of certaine Cements and Quarries. Exp. 1.                             | ibid.    |
| Of the Altering of Colours in Haires and Feathers. Exp. 1.            | ibid.    |
| Of the Differences of Living Creatures, Male and Female. Exp. 1.      | pag. 184 |
| Of the Comparative Magnitude of Living Creatures. Exp. 1.             | ibid.    |
| Of Producing Fruit without Coare or Stone. Exp. 1.                    | ibid.    |
| Of the Melioration of Tobacco. Exp. 1.                                | pag. 185 |
| Of Severall Heats working the same Effects. Exp. 1.                   | ibid.    |
| Of Swelling and Dilatation in Boyling. Exp. 1.                        | ibid.    |
| Of the Dulcoration of Fruits. Exp. 1.                                 | pag. 186 |
| Of Flesh Edible, and not Edible. Exp. 1.                              | ibid.    |
| Of the Salamander. Exp. 1.                                            | ibid.    |
| Of the Contrary Operations of Time, upon Fruits and Liquours. Exp. 1. | pag. 187 |
| Of Blowes and Bruises. Ex. 1.                                         | ibid.    |
| Of the Orris Root. Exp. 1.                                            | ibid.    |
| Of the Gompresion of Liquours. Exp. 1.                                | ibid.    |
| Of the Working of Water upon Aire Contiguous. Exp. 1.                 | ibid.    |
| Of the Nature of Aire. Exp. 1.                                        | pag. 188 |
| Of the Eyes and sight. Exp. 7.                                        | ibid.    |
| Of the Colour of the Sea, or other water. Exp. 1.                     | pag. 189 |
| Of Shell-fish. Exp. 1.                                                | ibid.    |
| Of the Right Side, and the Left. Exp. 1.                              | pag. 190 |
| Of Frictions. Exp. 1.                                                 | ibid.    |
| Of Globes appearing flat at distance. Exp. 1.                         | ibid.    |
| Of Shadowes. Exp. 1.                                                  | ibid.    |
| Of the Rowling and Breaking of the Seas. Exp. 1.                      | ibid.    |
| Of the Dulcoration of Salt-water. Exper. 1.                           | ibid.    |
| Of the Returne of Salinesse in Pits by the Sea-Shoare. Exper. 1.      | pag. 191 |
| Of Attraction by Similitude of Substance. Exp. 1.                     | ibid.    |
| Of Attraction. Exp. 1.                                                | ibid.    |
| Of Heat under Earth. Exp. 1.                                          | ibid.    |
| Of Flying in the Aire. Exp. 1.                                        | ibid.    |
| Of the Scarlet Dye. Exp. 1.                                           | ibid.    |
| Of Maleficiating. Exp. 1.                                             | pag. 192 |
| Of the Rise of Liquours, or Powders, by meanes of Flame. Exp.         | ibid.    |



Salted throughout) goeth to the Bottome. And therefore no marvaile, if the Drayning of *water* by descent, doth not make it fresh : Besides, I doe somewhat doubt, that the very Dashing of the *water*, that commeth from the Sea, is more proper to strike off the Salt part, than where the *Water* slideth of her owne Motion.

3

It seemeth *Percolation* or *Transmission*, (which is commonly called *Straining*, ) is a good kinde of *Separation*, Not onely of Thicke from Thin, and Grosse from Fine, But of more subtile Natures; And varieth according to the Body through which the *Transmission* is made. As if through a woollen Bagg, the Liquour leaveth the Fatnesse; If through Sand, the Saltnesse; &c. They speake of Severing Wine from Water, passing it through Ivy wood, or through other the like porous Body; But *Non constat*.

4

The *Gumm* of *Trees* (which we see to bee commonly shining and cleare) is but a fine Passage or *Straining* of the Juyce of the Tree, through the Wood and Barke. And in like manner, *Cornish Diamonds*, and *Rock Rubies*, (which are yet more resplendent than *Gumms*) are the fine Exudations of *Stone*.

5

*Aristotle* giveth the Cause, vainly, why the *Feathers* of *Birds* are of more lively Colours, than the *Haires* of *Beasts*; for no *Beast* hath any fine Azure, or Carnation, or Greene *Haire*. He saith, It is, because *Birds* are more in the Beames of the Sunne, than *Beasts*; but that is manifestly untrue; For *Cattle* are more in the Sunne than *Birds*, that live commonly in the Woods, or in some Covert. The true Cause is, that the Excrementitious Moisture of living Creatures, which maketh as well the *Feathers* in *Birds*, as the *Haire* in *Beasts*, passeth in *Birds* through a finer and more delicate Strainer, than it doth in *Beasts*: For *Feathers* passe through Quills; And *Haire* through Skin.

6

The *Clarifying* of *Liquors* by *Adhesion*, is an Inward *Percolation*; And is effected, when some Cleaving Body is Mixed and Agitated with the *Liquors*; whereby the grosser Part of the *Liquor* sticks to that Cleaving Body; And so the finer Parts are freed from the Grosser. So the *Apothecaries* clarifie their *Sirrups* by whites of Eggs, beaten with the Juices which they would clarifie; which whites of Eggs gather all the Dregs and grosser Parts of the Juice to them; And after the *Sirrup* being set on the Fire, the whites of Eggs themselves harder, and are taken forth. So *Ippocrasse* is clarified by mixing with Milke; And stirring it about, And then passing it through a Woollen Bagg, which they call *Hippocrates Sleeve*, And the Cleaving Nature of the Milke draweth the Powder of the Spices, and grosser parts of the *Liquor* to it; and in the passage they stick upon the Woollen bagge.

7

The *Clarifying* of *water*, is an *Experiment* tending to Health; besides the pleasure of the Eye, when *water* is Chrystaline. It is effected by casting in and placing Pebbles, at the Head of a Current; that the *water* may straine through them.

8

It may be, *Percolation* doth not onely cause Clearenesse and Splendour, but Sweetnesse of Savour. For that also followeth, as well as Clearenesse, when the Finer Parts are severed from the Grosser. So it is found, that the Sweats of Men that have much Heat, and exercise much, and have cleane Bodies, and fine Skinnes, doe smell sweet; As was said of *Alexander*; And we see, commonly, that *Gumms* have sweet Odours.

Experiments  
in Confort  
touching Mo-  
tion of Bodies  
upon their  
Pressure.

9

TAke a *Glasse*, and put *water* into it, and wet your Finger, and draw it round about the Lip of the *Glasse*, pressing it somewhat hard; And after you have drawne it some few times about, it will make the *Water* friske and



and sprinkle up, in a fine Dew. This *Instance* doth excellently Demonstrate the Force of *Compression* in a Solid Bodie. For whensoever a Solid Body (as Wood, Stone, Metall, &c.) is pressed, there is an inward Tumult in the parts thereof; seeking to deliver themselves from the Compression: And this is the Cause of all *Violent Motion*. Wherein it is strange in the highest Degree, that this *Motion* hath never beene observed, nor inquired; It being of all *Motions*, the most Common, and the Chiefe Root of all *Mechanicall Operations*. This *Motion* worketh in round at first, by way of Prooffe, and Search, which way to deliver it selfe; And then worketh in Progresse, where it findeth the Deliverance easiest. In *Liquors* this *Motion* is visible: For all Liquors stricken make round Circles, and withall Dash; but in *Solids*, (which breake not,) it is so subtile, as it is invisible; but nevertheless bewrayeth it selfe by many effects; as in this *Instance* whereof we speake. For the *Pressure* of the Finger furthered by the wetting (because it sticketh so much the better unto the Lip of the *Glasse*), after some continuance, putteth all the small Parts of the *Glasse* into worke; that they strike the *Water* sharply; from which *Percussion* that Sprinkling commeth.

If you strike or pierce a *Solid Body*, that is Brittle, as *Glasse*, or *Suger*, it breaketh not onely, where the immediate force is; but breaketh all about into shivers and fitters; The *Motion*, upon the *Pressure*, searching all wayes; and breaking where it findeth the *Body* weakest.

The *Powder* in *Shot*, being Dilated into such a *Flame*, as endureth not *compression*; Moveth likewise in round, (The *Flame* being in the Nature of a *liquid Body*;) Sometimes recoyling; Somerimes breaking the *Piece*; But generally discharging the *Bullet*, because there it findeth easiest Deliverance.

This *Motion* upon *Pressure*, and the Reciprocall thereof, which is *Motion* upon *Tension*; wee use to call (by one common Name) *Motion of Libertie*; which is, when any *Body*, being forced to a *Preter-Naturall* Extent, or *Dimension*, delivereth and restoreth it selfe to the *Naturall*: As when a *Blowne Bladder* (Pressed) riseth againe; or when *Leather* or *Chub* tentured spring backe. These two *Motions* (of which there bee infinite *Instances*;) we shall handle in due place.

This *Motion* upon *Pressure* is excellently also demonstrated in *Sounds*; As when one Chimeth upon a *Bell*, it soundeth; But as soone as he layeth his hand upon it, the *Sound* ceaseth: And so, the *Sound* of a *Virginal String*, as soone as the Quill of the Jack falleth from it, stoppeth. For these *Sounds* are produced, by the subtile *Percussion* of the Minute parts, of the *Bell*, or *String*, upon the *Aire*; All one, as the *Water* is caused to scape by the subtile *Percussion* of the Minute parts of the *Glasse*, upon the *Water*, whereof we spake a little before in the ninth *Experiment*. For you must not take it to be, the locall *Shaking* of the *Bell*, or *String*, that doth it. As wee shall fully declare, when we come hereafter to handle *Sounds*.

TAKE a *Glasse* with a *Belly* and a long *Neb*; fill the *Belly* (in part) with *Water*: Take also another *Glasse*, whereinto put *Claret Wine* and *Water* mingled; Reverse the first *Glasse*, with the *Belly* upwards, Stopping the *Neb* with your finger; Then dip the Mouth of it within the Second *Glasse*, and remove your Finger: Continue it in that posture for a time; And it will unminge the *Wine* from the *Water*: The *Wine* ascending and settling in the top of the upper *Glasse*; And the *Water* descending and settling in the bottome of the lower *Glasse*. The passage is apparent to the Eye; For

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14

Experiments  
in Confort  
touching Sepa-  
rations of Bo-  
dies by Weight.

14



you shall see the *wine*, as it were, in a small veine, rising through the *water*. For handfomnesse sake (because the Working requireth some small time) it were good you hang the upper *Glas*se upon a Naile. But as soone as there is gathered so much pure and unmixed *water* in the Bottome of the Lower *Glas*se, as that the Mouth of the upper *Glas*se dippeth into it, the *Motion* ceaseth.

15

Let the Upper *Glas*se be *Wine*, and the Lower *water*; there followeth no *Motion* at all. Let the Upper *Glas*se be *Water* pure, the Lower *Water* coloured; or contrariwise; there followeth no *Motion* at all. But it hath been tryed, that though the Mixture of *Wine* and *Water*, in the Lower *Glas*se, bee three parts *Water*, and but one *Wine*; yet it doth not dead the *Motion*. This Separation of *Water* and *Wine* appeareth to bee made by *Weight*; for it must be of *Bodies* of unequall *Weight*, or else it worketh not; And the Heavier *Body* must ever bee in the upper *Glas*se. But then note withall, that the *Water* being made penfile, and there being a great *Weight* of *Water* in the Belly of the *Glas*se, sustained by a small Piller of *Water* in the Neck of the *Glas*se; It is that, which setteth the *Motion* on worke: For *Water* and *Wine* in one *Glas*se, with long standing, will hardly sever.

16

This Experiment would be Extended from Mixtures of severall *Liquours*, to *Simple Bodies*, which Consist of severall Similare Parts: Try it therefore with *Broyne* or *Salt water*, and *Fresh water*: Placing the *Salt water* (which is the heavier) in the upper *Glas*se; And see whether the *Fresh* will come above. Trie it also with *Water thick Sugred*, and *Pure water*; and see whether the *water* which commeth above, will lose his Sweetnesse: For which purpose it were good there were a little Cock made in the Belly of the upper *Glas*se.

Experiments  
in Confort  
touching Iudi-  
cious and Accu-  
rate Infusions,  
both in Li-  
quors, and Aire.

17

**I**N *Bodies* containing Fine Spirits, which doe easily dissipate, when you make *Infusions*, the Rule is; A short Stay of the *Body* in the *Liquour* receiveth the Spirit; And a longer Stay confoundeth it; because it draweth forth the Earthy Part withall; which embaseth the finer. And therefore it is an Errour in *Physicians*, to rest simply upon the Length of stay, for increasing the vertue. But if you will have the *Infusion* strong, in those kind of *Bodies*, which have fine Spirits, your way is, not to give Longer time, but to repeat the *Infusion* of the *Body* oftner. Take *Viols*, and infuse a good Pugill of them in a Quart of Vineger; Let them stay three quarters of an houre, and take them forth; And refresh the *Infusion* with like quantity of new *Viols*, seven times; And it will make a Vineger so fresh of the *Flower*, as if a Twelve-moneth after, it be brought you in a Saucer, you shall smell it before it come at you. Note, that it smelleth more perfectly of the *Flower*, a good while after, than at first.

18

This Rule, which we have given, is of singular use, for the Preparations of *Medicines*, and other *Infusions*. As for Example; the Leafe of *Burrage* hath an Excellent Spirit, to repress the fuliginous Vapour of Dusky Melancholy, and so to cure Madnesse: But neverthelesse, if the Leafe bee infused long, it yeeldeth forth but a raw substance, of no Vertue: Therefore I suppose, that if in the Must of *Wine*, or Wort of *Beere*, while it worketh, before it bee Tunned, the *Burrage* stay a small time, and bee often changed with fresh; It will make a Sovereigne Drinke for Melancholy Passions. And the like I conceive of *Orange Flowers*.

19

*Rubarb* hath manifestly in it Parts of contrary Operations: Parts that purge; And parts that binde the body: And the first lay looser, and the latter lay deeper:



deeper: So that if you infuse *Rubarb* for an houre, and crush it well, it will purge better, and binde the Body lesse after the purging, than if it stood twenty foure houres; This is tryed: But I conceive likewise, that by Repeating the *Infusion* Of *Rubarb*, severall times, (as was said of *Violets*,) letting each stay in but a small time; you may make it as strong a *Purging Medicine*, as *Scammony*. And it is not a small thing wonne in *Physick*, if you can make *Rubarb*, and other *Medicines* that are *Benedict*, as strong *Purgers*, as those that are not without some *Malignity*.

*Purging Medicines*, for the most part, have their *Purgative* Vertue, in a fine Spirit; As appeareth by that they endure not boyling, without much losse of vertue. And therefore it is of good use in *Physick*, if you can retaine the *Purging* Vertue, and take away the Unpleasant taste of the *Purger*; which it is like you may doe, by this Course of *Infusing* oft, with little stay. For it is probable, that the Horrible and Odious Taste, is in the Grosser part.

Generally, the working by *Infusions*, is grosse and blinde, except you first trie the Issuing of the severall Parts of the Bodie, which of them Issue more speedily, and which more slowly; And so by appportioning the time, can take and leave that Quality, which you desire. This to know, there be two wayes; The one to trie what long stay, and what short stay worketh, as hath beene said: The other to trie in Order, the succeeding *Infusions*, of one and the same Bodie, successively, in severall *Liquours*. As for example; Take *Orenge-Pils*, or *Rose-Mary*, or *Cinnamon*, or what you will; And let them *Infuse* halfe an houre in *Water*: Then take them out, and *Infuse* them againe in other *Water*; And so the third time: And then taste and consider the first *Water*, the *Second*, and the *Third*: And you will find them differing, not only in Strength and Weaknesse, but otherwise in Taste, or Odour; For it may be the *First water* will have more of the Sent, as more Fragrant; And the *Second* more of the Taste, as more bitter or Biting, &c.

*Infusions* in *Aire*, (for so we may well call *Odours*) have the same diversities with *Infusions* in *Water*; In that the severall *Odours* (which are in one Flower, or other Body) issue at severall times; Some earlier, some later: So wee finde that *Violets*, *Woodbines*, *Siramberries*, yeeld a pleasing Sent, that commeth forth first; But soone after an ill Sent quite differing from the Former. Which is caused, not so much by Mellowing, as by the late Issuing of the Grosser Spirit.

As we may desire to extract the finest Spirits in some Cases; So we may desire also to discharge them (as hurtfull) in some other. So *wine burne*, by reason of the Evaporating of the finer Spirit, enflameth lesse, and is best in Agues: *Opium* leeseeth some of his poysonous Qualitie, if it be vapoured out, mingled with *Spirit of wine*, or the like: *Sean* leeseeth somewhat of his windinesse by Decocting; And (generally) subtiler or windy Spirits are taken off by Incension, or Evaporation. And even in *Infusions* in things that are of too high a Spirit, you were better powre off the first *Infusion*, after a small time, and use the latter.

**B**ubbles are in the forme of an *Hemisphere*; *Aire* within, and a little Skin of *Water* without: And it seemeth somewhat strange, that the *Aire* should rise so swiftly, while it is in the *Water*; And when it commeth to the top, should be stayed by so weake a Cover as that of the *Bubble* is. But as for the swift Ascent of the *Aire*, while it is under the *Water*, that is a *Motion* of *Percussion* from the *Water*; which it selfe descending, driveth up the *Aire*; and no *Motion* of *Levity* in the *Aire*. And this *Democritus*

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23

Experiment  
Solitary touching the  
Appetite of Continuation in  
Liquids.

24



called *Motus Plagæ*. In this Common Experiment, the Cause of the Enclosure of the *Bubble* is, for that the Appetite to resist Separation, or Discontinuance, (which in solide *Bodies* is strong) is also in *Liquours*, though fainter and weaker; As wee see in this of the *Bubble*: we see it also in little Glasses of Spittle that children make of Rushes; And in Castles of Bubbles, which they make by blowing into *water*, having obtained a little Degree of Tenacity by Mixture of Soape: Wee see it also in the *Sillicides* of *water*, which if there be *water* enough to follow, will Draw themselves into a small thred, because they will not discontinue; But if there be no Remedy, then they cast themselves into round Drops; which is the Figure, that saveth the Body most from Discontinuance: The same Reason is of the Roundnesse of the *Bubble*, as well for the Skin of *water*, as for the *Aire* within: For the *Aire* likewise avoideth *Discontinuance*; And therefore casteth it selfe into a round Figure. And for the stopp and Arrest of the *Aire* a little while, it sheweth that the *Aire* of it selfe hath little, or no Appetite, of Ascending.

Experiment  
Solitary touching the  
making of Artificiall Springs.

25

THE Rejection, which I continually use, of Experiments, (though it appeareth not) is infinite; But yet if an Experiment be probable in the Worke, and of great Use, I receive it, but deliver it as doubtfull. It was reported by a Sober Man, that an Artificiall Spring may be made thus: Finde out a hanging Ground, where there is a good quick Fall of Rain-water. Lay a Halfe-Trough of Stone, of a good length, three or four foot deepe within the same Ground, with one end upon the high Ground, the other upon the low. Cover the Trough with Brakes a good thicknesse, and cast Sand upon the Top of the Brakes: You shall see, (saith hee) that after some showres are past, the lower end of the Trough will runne like a Spring of *water*: which is no marvaile, if it hold, while the Raine-water lasteth; But hee said it would continue long time after the Raine is past: As if the water did multiply it selfe upon the *Aire*, by the helpe of the Coldnesse and Condensation of the Earth, and the Consort of the first *Water*.

Experiment  
Solitary touching the  
Venomous Quality  
of Mans Flesh.

26

THE French, (which put off the Name of the French Disease, unto the Name of the Disease of Naples,) doe report, that at the Siege of Naples, there were certaine wicked Merchants that Barrelled up Mans flesh, (of some that had been lately slain in *Barbary*) and sold it for Tunney; And that upon that foule and high Nourishment, was the Originall of that Disease. Which may well bee; For that it is certaine, that the *Caniballs* in the *West Indies*, eat Mans flesh; And the *West Indies* were full of the Pocks when they were first discovered: And at this day the Mortalest poisons, practised by the *West Indians*, have some Mixture of the Bloud, or Fat, or Flesh of *Man*: And divers Witches, and Sorceresses, as well amongst the *Heathen*, as amongst the *Christians*, have fed upon Mans flesh, to aid (as it seemeth) their Imagination, with high and foule Vapours.

Experiment  
Solitary touching the  
Version and Transmutation  
of Aire into  
water.

27

IT seemeth that there bee these wayes (in likelihood) of Version of Vapours or Aire, into *Water* and *Moisture*. The first is Cold; which doth manifestly Condense; as wee see in the Contracting of the Aire in the Weather-Glasse; whereby it is a Degree nearer to *water*. Wee see it also in the Generation of Springs, which the *Anciens* thought (very probably) to be made by the Version of Aire into *water*, holpen by the Rest, which the Aire hath in those Parts; whereby it cannot dissipate. And by the Coldnesse of Rocks; for there



there *Springs* are chiefly generated. We see it also in the Effects of the Cold of the *Middle Region* (as they call it) of the *Aire*; which produceth *Dewes*, and *Raines*. And the Experiment of Turning *water* into *Ice*, by *Snow*, *Nitre*, and *Salt*, (whereof we shall speak hereafter,) would be transferred to the Turning of *Aire* into *Water*. The Second way is by *Compression*, As in *Stillatories*, where the Vapour is turned back, upon it selfe, by the Encounter of the Sides of the *Stillatory*; And in the *Dew* upon the Covers of *Boyling Pots*; And in the *Dew* towards *Raine*, upon *Marble*, and *Wainscot*. But this is like to doe no great effect; Except it be upon Vapours, and grosse *Aire*, that are already very neare in Degree to *Water*. The Third is that, which may be searched into, but doth not yet appeare; which is, by *Mingling* of moist Vapours with *Aire*; And trying if they will not bring a Returne of more *water*, than the *Water* was at first: For if so, That Increase is a *Version* of the *Aire*: Therefore put *water* into the Bottome of a *Stillatory*, with the *Neb* stopped; Weigh the *Water* first; Hang in the Middle of the *Stillatory* a large *Sponge*; And see what Quantity of *Water* you can crush out of it; And what it is more, or lesse, compared with the *water* spent; For you must understand, that if any *Version* can be wrought, it will be easiest done in small Pores: And that is the Reason why we prescribe a *Sponge*. The Fourth way is Probable also, though not Appearing; Which is, by *Receiving* the *Aire* into the small Pores of *Bodies*; For (as hath beene said) every thing in small Quantity is more easie for *version*; And Tangible Bodies have no pleasure in the comfort of *Aire*, but endeavour to subact it into a more Dense Body: But in *Entire Bodies* it is checked; because if the *Aire* should Condense, there is nothing to succeed: Therefore it must be in loose Bodies, as *Sand*, and *Powder*; which we see, if they lie close, of themselves gather Moisture.

IT is reported by some of the *Ancients*; That *whelps*, or other *Creatures*, if they be put Young, into such a Cage, or Box, as they cannot rise to their Stature, but may increase in Breadth, or length, will grow accordingly, as they can get Room: which if it be true, and faisible, and that the young *Creature* so pressed, and straitened, doth not thereupon die: It is a Meanes to produce *Dwarfe Creatures*, and in a very Strange figure. This is certaine, and noted long since; That the Pressure or Forming of Parts of *Creatures*, when they are very young, doth alter the Shape not a little; As the Stroaking of the Heads of *Infants*, between the Hands, was noted of Old, to make *Macrocephali*; which shape of the Head, at that time, was esteemed. And the Raising gently of the Bridge of the Nose, doth prevent the Deformity of a Saddle Nose. Which observation well weighed, may teach a Meanes, to make the Persons of Men, and Women, in many kindes, more comely, and better featured, than otherwise they would be; By the Forming and Shaping of them in their Infancy: As by Stroaking up the Calves of the Legges, to keep them from falling down too low; And by Stroaking up the Forehead to keepe them from being low-foreheaded. And it is a common Practice to swathe *Infants*, that they may grow more straight, and better shaped: And we see Young Women, by wearing straight Bodies, keepe themselves from being Grosse and Corpulent.

ONions, as they hang, will many of them shoot forth, and so will *Penniroiall*; and so will an Herbe called *Orpin*; with which they use, in the Country, to trimme their Houses, binding it to a Lath, or Stick, and setting it against a wall. We see it likewise, more especially, in the greater

Semer-

Experiment  
Solitary touch-  
ing helps  
towards the  
Beauty and good  
Features of  
Persons.

28

Experiment  
Solitary touch-  
ing the Con-  
densing of Aire  
in such sort as  
it may put on  
weight, and  
yeeld Nourish-  
ment.

29



*Semper-vive*, which will put out Branches, two or three yeares : But it is true, that commonly they wrap the Root in a Cloth besmeared with Oyle, and renue it once in halfe a Yeare. The like is reported by some of the *Antients*, of the *Stalks of Lillies*. The Cause is ; For that these *Plants* have a Strong, Dense, and Succulent Moisture, which is not apt to exhale ; And so is able, from the old store, without drawing helpe from the Earth, to suffice the sprouting of the *Plant* : And this Sprouting is chiefly in the late Spring, or early Sommer, which are the Times of Putting forth. Wee see also, that *Stumps of Trees*, lying out of the ground, will put forth Sprouts for a Time. But it is a Noble Triall, and of very great Consequence, to try whether these things, in the Sprouting, doe increase *Weight*, which must be tryed, by weighing them before they be hang'd up ; And afterwards againe, when they are sprouted. For if they increase not in *Weight* ; Then it is no more but this ; That what they send forth in the Sprout, they leese in some other Part : But if they gather *Weight*, then it is *Magnale Naturæ* ; For it sheweth that *Aire* may be made so to be Condensed, as to be converted into a *Dense Body* ; whereas the Race and Period of all things, here above the Earth, is to extenuate and turne things to be more *Pneumaticall*, and Rare ; And not to be Retrograde, from *Pneumaticall* to that which is *Dense*. It sheweth also, that *Aire* can *Nourish*, which is another great Matter of Consequence. Note, that to trie this, the *Experiment* of the *Semper-vive*, must be made without Oyling the Cloth ; For else, it may bee, the *Plant* receiveth Nourishment from the Oyle.

Experiment  
Solitary touch-  
ing the Com-  
mixture of  
Flame and  
Aire, and the  
great Force  
thereof.

30

**F**lame and Aire doe not Mingle, except it be in an *Instant* ; Or in the *vitall Spirits* of *vegetables*, and *living Creatures*. In *Gunpowder*, the Force of it hath beene ascribed, to Rarefaction of the Earthy Substance into *Flame* ; And thus farre it is true : And then (forsooth) it is become another Element ; the Forme whereof occupieth more place ; And so, of Necessitie, followeth a Dilatation : And therefore, lest two Bodies should bee in one place, there must needs also follow an Expulsion of the Pellet, Or blowing up of the Mine. But these are Crude and Ignorant Speculations. For *Flame*, if there were nothing else, except it were in very great quantity, will be suffocate with any hard Body, such as a Pellet is ; Or the Barrell of a Gunn ; So as the *Flame* would not expell the hard Body ; But the hard Body would kill the *Flame*, and not suffer it to kindle, or spread. But the Cause of this so potent a Motion, is the *Nitre*, (which we call otherwise *Salt-Petre* ; ) which having in it a notable Crude and windy *Spirit*, first by the Heat of the Fire suddenly dilateth it selfe ; ( And we know that simple *Aire*, being preternaturally attenuated by Heat ; will make it selfe Roome, and breake, and blow up that which resisteth it ; ) And Secondly, when the *Nitre* hath dilated it selfe, it bloweth abroad the *Flame*, as an inward Bellows. And therefore we see that *Brimstone*, *Pitch*, *Camphire*, *Wilde-Fire*, & divers other Inflammable Matters, though they burne cruelly, and are hard to quench, Yet they make no such fiery winde, as *Gunpowder* doth : And on the other side, we see that *Quick-Silver*, (which is a most Crude and Watry Body) heated, and pent in, hath the like force with *Gunpowder*. As for *living Creatures*, it is certaine, their *Vitall Spirits* are a Substance Compounded of an *Airy* and *Flammy* Matter ; And though *Aire* and *Flame* being free, will not well mingle, yet bound in by a *Body* that hath some fixing, they will. For that you may best see in those two Bodies, (which are their *Aliments*, ) *Water*, and *Oyle* ; For they likewise will not well mingle of themselves, but in the Bodies of *Plants*, and



and *Living Creatures*, they will. It is no marvail therefore, that a small *Quantity of Spirits*, in the Cels of the Braine, and Cannals of the *Sinewes*, are able to move the whole Body, (which is of so great Masse,) both with so great Force, as in Wrestling, Leaping; And with so great Swiftnesse, as in playing Division upon the *Lute*. Such is the force of these two Natures, *Aire* and *Flame*, when they incorporate.

**T**Ake a small *wax Candle*, and put it in a Socket, of *Brasse*, or *Iron*; Then set it upright in a *Porringer* full of *Spirit of wine*, heated: Then set both the *Candle*, and *Spirit of wine*, on fire, and you shall see the *Flame* of the *Candle*, open it selfe, and become foure or five times bigger than otherwise it would have beene; and appeare in Figure *Globular*, and not in *Piramis*. You shall see also, that the *Inward Flame* of the *Candle* keepeth Colour, and doth not wax any whit blew towards the Colour of the *Outward flame* of the *Spirit of wine*. This is a *Noble Instance*; wherein two things are most remarkable; The one, that one *Flame* within another quencheth not, but is a fixed Body, and continueth as *Aire*, or *water* doe. And therefore *Flame* would still ascend upwards in one greatnesse, if it were not quenched on the *Sides*: And the greater the *Flame* is at the *Bottom*, the higher is the *Rise*. The other, that *Flame* doth not mingle with *Flame*, as *Aire* doth with *Aire*, or *water* with *water*, but onely remaineth contiguous; As it commeth to passe betwixt *Consisting Bodies*. It appeareth also, that the forme of a *Piramis* in *Flame*, which we usually see, is meerely by *Accident*, and that the *Aire* about, by quenching the *Sides* of the *Flame*, crusheth it, and extenuateth it into that *Forme*; For of it selfe it would be *Round*: And therefore *Smoake* is in the Figure of a *Piramis* *Reversed*; For the *Aire* quencheth the *Flame*, and receiveth the *Smoake*. Note also, that the *Flame* of the *Candle*, within the *Flame* of the *Spirit of wine*, is troubled; And doth not only open and move upwards, but moveth waving, and to and fro: As if *Flame* of his owne Nature (if it were not quenched,) would rowle and turne, as well as move upwards. By all which it should seeme, that the *Cœlestiall Bodies*, (most of them,) are true *Fires* or *Flames*, as the *Stoicks* held; More fine (perhaps) and *Rarified*, than our *Flame* is. For they are all *Globular*, and *Determinate*; They have *Rotation*; And they have the Colour and *Splendour* of *Flame*: So that *Flame* above is *Durable*, and *Consistent*, and in his *Naturall place*; But with us, it is a *Stranger*, and *Momentany*, and *Impure*; Like *Vulcan* that halted with his Fall.

**T**Ake an *Arrow*, and hold it in *Flame*, for the space of ten pulses; And when it commeth forth, you shall finde those *Parts* of the *Arrow*, which were on the *Outsides* of the *Flame*, more burned, blacked, and turned almost into a *Coale*; whereas that in the *Middest* of the *Flame*, will be, as if the *Fire* had scarce touched it. This is an *Instance* of great consequence for the discovery of the Nature of *Flame*; And sheweth manifestly, that *Flame* burneth more violently towards the *Sides*, than in the *Middest*: And, which is more, that *Heat* or *Fire* is not violent or furious, but where it is checked and pent. And therefore the *Peripateticks* (howsoever their opinion of an *Element* of *Fire* above the *Aire* is justly exploded;) in that Point they acquit themselves well: For being opposed, that if there were a *Spheare* of *Fire*, that incompassed the *Earth* so neare hand, it were impossible but all things should be burnt up; They answer, that the pure *Elementall Fire*, in his owne place, and not irritate, is but of a *Moderate Heat*.

Experiment  
Solitary touching the  
Secret Nature of  
Flame.

31

Experiment  
Solitary touching the  
Different force of  
Flame in the  
Middest and on  
the Sides.

32

It



Experiment  
Solitary tou-  
ching the De-  
crease of the  
Naturall motion  
of Gravity in  
great distance  
from the Earth;  
or within some  
depth of the  
Earth.

33

IT is affirmed constantly by many, as an usuall Experiment; That a *Lump* of *Fire*, in the *Bottom* of a *Mine*, will be tumbled, and stirred, by two Mens strength; which if you bring it to the *Top* of the *Earth*, will aske Six Mens strength at the least to stirre it. It is a Noble *Instance*, and is fit to be tryed to the full: For it is very probable, that the *Motion* of *Gravities* worketh weakly, both farre from the *Earth*, and also within the *Earth*: The former, because the Appetite of Union of Dense Bodies with the *Earth*, in respect of the distance, is more dull; The latter, because the Body hath in part attained his Nature, when it is some Depth in the *Earth*. For as for the *Moving* to a *Point* or *Place* (which was the Opinion of the *Ancient*) it is a meere Vanity.

Experiment  
Solitary tou-  
ching the Con-  
traction of Bo-  
dies in Bulk, by  
the Mixture of  
the more Li-  
quid Body with  
the more Solid

34

IT is strange, how the *Ancients* tooke up *Experiments* upon credit, and yet did build great Matters upon them. The Observation of some of the best of them, delivered confidently is, That a *Vessell* filled with *Ashes*, will receive the like quantity of *Water*, that it would have done, if it had beene empty. But this is utterly untrue, for the *Water* will not goe in by a Fifth part. And I suppose, that that Fifth part is the difference of the lying close, or open, of the *Ashes*; As wee see that *Ashes* alone, if they be hard pressed, will lie in lesse room: And so the *Ashes* with *Aire* between, lie looser, and with *Water*, closer. For I have not yet found certainly, that the *Water*, it selfe, by mixture of *Ashes*, or *Dust*, will shrink or draw into lesse Roome.

Experiment  
Solitary tou-  
ching the Ma-  
king Vines  
more fruitfull.

35

IT is reported of credit, that if you lay good store of *Kernels* of *Grapes*, about the *Root* of a *Vine*; it will make the *Vine* come earlier and prosper better. It may be tryed with other *Kernels*, laid about the *Root* of a *Plant* of the same kinde; As *Piggs*, *Kernels* of *Apples*, &c. The Cause may be, for that the *Kernels* draw out of the *Earth* Juice fit to nourish the *Tree*, as those that would be *Trees* of themselves, though there were no *Root*; But the *Root* being of greater strength, robbeth and devoureth the Nourishment, when they have drawne it: As great *Fishes* devoure little.

Experiments  
in Confort  
touching Pur-  
ging Medicines.

36

THE Operation of *Purging Medicines*, and the Causes thereof, have beene thought to be a great Secret; And so according to the slothfull manner of Men, it is referred to a *Hidden Propriety*, a *Specificall vertue*, and a *Fourth Quality*, & the like Shifts of Ignorance. The Causes of *Purging* are divers; all plain and perspicuous, and throughly maintained by Experience. The first is, That whatsoever cannot be overcome and digested by the *Stomack*, is by the *Stomack*, either put up by *Vomit*, or put down to the *Guts*; And by that Motion of *Expulsion* in the *Stomack*, & *Guts*, other Parts of the *Body*, (as the *Orifices* of the *Veins*, & the like) are moved to expell by Consent. For nothing is more frequent than Motion of Consent in the *Body* of Man. This Surcharge of the *Stomack*, is caused either by the *Quality* of the *Medicine*, or by the *Quantity*. The *Qualities* are three: *Exireme Bitter*, as in *Aloës*, *Coloquintida*, &c. Loathsome and of horrible taste; As in *Agarick*, *Black Hellebore*, &c. And of secret *Malignity*, & disagreement towards Mans *Body*, many times not appearing much in the Taste; As in *Scammony*, *Mechoacham*, *Antimony*, &c. And note well, that if there be any *Medicine* that *Purge*th, and hath neither of the first two *Manifest Qualities*; it is to bee held suspected, as a kinde of *Poyson*; For that it worketh either by *Corrosion*, or by a secret *Malignity*, and Enmity to *Nature*: And therefore such *Medicines* are warily to be prepared, and used. The *Quantity* of that which is taken, doth also cause *Purging*; As we see in a great *Quantity* of *New M.lke* from the *Cow*; yea and a great *Quantity* of *Meat*; For

Surfets



*Surfers* many times turne to *Purges*, both upwards, and downwards. Therefore we see generally, that the working of *Purging Medicines* commeth two or three houres after the *Medicines* taken; For that the *Stomack* first maketh a prooffe, whether it can concoct them. And the like happeneth after *Surfers*; Or *Milke* in too great *Quantity*.

A second Cause is *Mordication* of the *Orifices* of the *Paris*; Especially of the *Mesentery veines*; As it is scene, that *Salt*, or any such thing that is sharp and biting, put into the *Fundament*, doth provoke the Part to expell; And *Mustard* provoketh Sneezing: And any sharp Thing to the Eyes provoketh Teares. And therefore we see that almost all *Purgers* have a kinde of *Twitching* and *vellication*, besides the *Gripping* which commeth of winde. And if this *mordication* be in an over-high Degree, it is little better than the *Corrosion* of *Poyson*; And it commeth to passe sometimes in *Antimony*; Especially if it be given to bodies not repleat with Humours; for where Humours abound, the Humours save the Parts.

The third Cause is *Attraction*: For I doe not deny, but that *Purging Medicines* have in them a direct Force of *Attraction*; As *Drawing Plaisters* have in *Surgery*: And wee see *Sage*, or *Bettony* brused, *Sneezing-powder*, and other *Powders* or *Liquours* (which the *Physitians* call *Errhines*;) put into the Nose, draw *Flegme*, and water from the Head; And so it is in *Apophlegmatismes*, and *Gargarismes*, that draw the Rheume downe by the Pallat. And by this Vertue, no doubt, some *Purgers* draw more one Humour, and some another, according to the opinion received: As *Rubarb* draweth Choller; *Sean* Melancholy; *Agarick* Flegme; &c. But yet, (more or lesse) they draw promiscuously. And note also, that besides Sympathy, between the *Purger* and the Humour, there is also another Cause, why some *Medicines* draw some Humour more than another. And it is, for that some *Medicines* worke quicker than others: And they that draw quick, draw onely the Lighter, and more fluide Humours; they that draw slow, worke upon the more Tough, and Viscous Humours. And therefore Men must beware, how they take *Rubarb*, and the like, alone, familiarly; For it taketh onely the Lightest part of the Humour away, and leaveth the Masse of Humours more obstinate. And the like may be said of *Worme-wood*, which is so much magnified.

The fourth Cause is *Flatulencie*; For wine stirred moveth to expell: And wee findethat (in effect) all *Purgers* have in them a raw *Spirit*, or *Winde*; which is the Principall Cause of *Tortion* in the *Stomach*, and *Belly*. And therefore *Purgers* leese (most of them) the vertue, by Decoction upon the Fire; And for that Cause are given chiefly in Infusion, Juyce, or Powder.

The fift Cause is *Compression*, or *Crushing*: As when water is Crushed out of a *Sponge*: So wee see that *Taking Cold* moveth loosenesse by Contracti- of the skin, and outward Parts; And so doth Cold likewise cause Rheumes, and Defluxions from the Head; And some *Astringent Plasters* crush out purulent Matter. This kinde of Operation is not found in many *Medicines*: *Mirabolanes* have it; And it may be the *Barkes of Peaches*; For this Vertue requireth an *Astriction*; but such an *Astriction*, as is not gratefull to the Body; (For a pleasing *Astriction* doth rather Binde in the Humours, than Expell them:) And therefore such *Astriction* is found in Things of an Harsh Taste.

The Sixth Cause is *Lubrefaction*, and *Relaxation*. As wee see in *Medicines Emollient*; Such as are *Milke*, *Honey*, *Mallows*, *Lettuce*, *Mercuriall*, *Pellitory of the Wall*, and others. There is also a secret Vertue of *Relaxation* in Cold: For the Heat of the Body bindeth the Parts and Humours together, which

Colt,

37

38

39

40

41



*Cold*, relaxeth: As it is seene in *Vrine*, *Bloud*, *Pottage*, or the like; which, if they be *Cold*, Breake, and dissolve. And by this kinde of *Relaxation*, *Feare* looseth the *Belly*; because the *Heat* retiring inwards towards the *Heart*, the *Gutts* and other *Parts* are relaxed; In the same manner as *Feare* also causeth Trembling in the *Sinewes*. And of this Kinde of *Purgers* are some *Medicines* made of *Mercury*.

42

The Seventh Cause is *Absterfion*; which is plainly a *Scouring* off, or *Incision* of the more viscom *Humours*, and making the *Humours* more fluide; And Cutting betweene them, and the *Part*. As is found in *Nitrous water*, which scoureth *Linnen Cloth* (speedily) from the *Foulenesse*. But this *Incision* must bee by a *Sharpnesse*, without *Astriction*: Which we finde in *Salt*, *Wormewood*, *Oxymel*, and the like.

43

There be *Medicines*, that move *Stooles*, and not *Vrine*; Some other, *Vrine*, and not *Stooles*. Those that *Purge* by *Stooles*, are such as enter not at all, or little into the *Mesentery Veines*; But either at the first are not digestible by the *Stomach*, and therefore move immediately downwards to the *Gutts*; Or else are afterwards rejected by the *Mesentery Veines*, and so turne likewise downwards to the *Gutts*; and of these two kinds are most *Purgers*. But those that move *Vrine*, are such as are well digested of the *Stomach*, and well received also of the *Mesentery Veines*; So they come as farre as the *Liver*, which sendeth *Vrine* to the *Bladder*, as the *Whey of Bloud*: And those *Medicines* being Opening and Piercing, doe fortifie the Operation of the *Liver*, in sending downe the wheyey Part of the *Bloud* to the *Reines*. For *Medicines Vrinative* doe not worke by Rejection, and Indigestion, as *Solutive* doe.

44

There bee divers *Medicines*, which in greater *Quantity*, move *Stooles*, and in smaller, *Vrine*: And so contrariwise, some that in greater *Quantity*, move *Vrine*, and in smaller, *Stooles*. Of the former sort is *Rubarb*, and some others. The Cause is, for that *Rubarb* is a *Medicine*, which the *Stomacke* in a small *Quantity* doth digest, and overcome, (being not *Flatuous*, nor *Loathsome*;) and so sendeth it to the *Mesentery Veines*; And so being opening, it helpeth downe *Vrine*: But in a greater *Quantity*, the *Stomacke* cannot overcome it, and so it goeth to the *Gutts*. *Pepper* by some of the *Ancients* is noted to bee of the second sort; which being in small *Quantity*, moveth winde in the *Stomack* and *Gutts*, and so expelleth by *Stooles*; But being in greater *Quantity*, dissipateth the *wind*; And it selfe getteth to the *Mesentery veines*; And so to the *Liver*, and *Reines*; where, by Heating and Opening, it sendeth downe *Vrine* more plentifully.

Experiments  
in Confort  
touching  
Meats and  
Drinks that are  
most Nourishing

45

WE have spoken of *Evacuating* of the *Body*; we will now speake something of the *Filling* of it by *Restoratives* in *Consumptions*, and *Emaciating Diseases*. In *Vegetables*, there is one *Part* that is more *Nourishing* than another; As *Graines*, and *Roots* nourish more, than the *Leaves*; in so much as the *Order* of the *Foliatanes* was put downe by the *Pope*, as finding *Leaves* unable to *Nourish* Mans *Bodie*. Whether there bee that difference in the *Flesh* of *Living Creatures*, is not well inquired: As whether *Livers*, and other *Entrails*, be not more *Nourishing*, than the *Outward Flesh*. We finde that amongst the *Romans*, a *Gooses Liver* was a great *Delicacy*, In so much as they had *Artificiall Means* to make it faire, and great; But whether it were more *Nourishing*, appeareth not. It is certaine, that *Marrow* is more *Nourishing* than *Fat*. And I conceive that some *Decoction* of *Bones*, and *Sinewes*, stamped, and well strained, would be a very *Nourishing Broth*: Wee finde also that *Scotch Skinck*, (which is a *Pottage* of strong *Nourishment*;) is made



made with the *Knees*, and *Sinewes* of *Beefe*, but long boiled: *Telley* also, which they use for a Restorative, is chiefly made of *Knuckles* of *Veale*. The *Pulp* that is within the *Crasfish* or *Crab*, which they spice and butter, is more Nourishing than the *Flesh* of the *Crab*, or *Crasfish*. The *Yolkes* of *Egges* are clearly more Nourishing than the *Whites*. So that it should seeme, that the Parts of *Living Creatures*, that lie more Inwards, nourish more than the Outward *Flesh*: Except it be the *Braine*; which the *Spirits* prey too much upon, to leave it any great Vertue of Nourishing. It seemeth for the Nourishing of *Aged Men*, or *Men* in *Consumptions*, some such thing should be Devised, as should be halfe *Chylus*, before it be put into the *Stomach*.

Take two large *Capons*; perboyle them upon a soft fire, by the space of an houre, or more, till in effect all the *Bloud* be gone. Adde in the Decoction the *Pill* of a *Sweet Limon*, or a good part of the *Pill* of a *Citron*, and a little *Mace*. Cut off the *Shankes*, and throw them away. Then with a good strong Chopping-knife, mince the two *Capons*, bones and all, as small as ordinary Minced Meat; Put them into a large neat *Boulter*; Then take a *Kilderkin*, sweet, and well seasoned, of foure Gallons of *Beere*, of 8. s. strength, new as it cometh from the Tunning; Make in the *Kilderkin* a great Bung-hole of purpose: Then thrust into it, the *Boulter* (in which the *Capons* are) drawne out in length; Let it steepe in it three Dayes, and three Nights, the Bung-hole open, to worke; Then close the Bung-hole, and so let it continue, a Day and an halfe; Then draw it into bottles, and you may drink it well after 3 dayes Botteling; And it will last 6 weekes (approved) It drinketh fresh, flowreth and mantleth exceedingly; It drinketh not newish at all; It is an excellent Drinke for a Consumption, to be drunke either alone, or Carded with some other *Beere*. It quencheth Thirst, and hath no whit of windinesse. Note, that it is not possible, that Meat and Bread, either in Broths, or taken with Drink, as is used, should get forth into the veins, and outward Parts, so finely, and easily, as when it is thus Incorporate, and made almost a *Chylus* aforehand.

Triall would bee made of the like Brew with *Potado Roots*, or *Burr Roots*, or the *Pith* of *Artichokes*, which are nourishing Meats: It may be tryed also, with other flesh; As *Pheasant*, *Partridge*, *Young Porke*, *Pigge*, *Venison*, especially of young *Deere*, &c.

A *Mortresse* made with the *Brawne* of *Capons*, stamped, and strained, and mingled (after it is made) with like quantity, (at the least,) of *Almond Butter*; is an excellent Meat to nourish those that are weake; Better than *Blanck-Manger*, or *Telley*: And so is the *Cullice* of *Cockes*, boyled thick with the like Mixture of *Almond Butter*: For the *Mortresse*, or *Cullice*, of it selfe, is more Savory and strong; And not so fit for Nourishing of weake Bodies; But the *Almonds* that are not of so high a taste as *Flesh*, doe excellently qualify it.

*Indian Maiz* hath (of certaine,) an excellent Spirit of Nourishment; But it must be thoroughly boyled, and made into a *Maiz-Cream* like a *Barley-Cream*. I judge the same of *Rize*, made into a Cream; For *Rize* is in *Turky*, and other Countries of the East, most fed upon; But it must be thoroughly boyled in respect of the Hardnesse of it: And also because otherwise it bindeth the body too much.

*Pistachoes*, so they be good, and not musty, joyned with *Almonds* in *Almond Milke*; Or made into a *Milk* of themselves, like unto *Almond Milke*, but more Greene, are an excellent Nourisher. But you shall doe well, to adde a little *Ginger*, scraped, because they are not without some subtile windinesse.



51

*Milke* warme from the Cow, is found to be a great Nourisher, and a good Remedy in *Consumptions*: But then you must put into it, when you *Milke* the Cow, two little bagges; the one of *Powder* of *Mint*, the other of *Powder* of *Red Roses*; For they keepe the *Milke* somewhat from Turning, or Crudling in the Stomach; And put in Sugar also, for the same cause, and partly for the Taste sake; But you must drinke a good draught, that it may stay lesse time in the Stomach, lest it Cruddle: And let the Cup into which you milke the Cow, be set in a greater Cup of hot water, that you may take it warme. And *Cow-milke* thus prepared, I judge to be better for a *Consumption*, than *Asse-milke*, which (it is true) turneth not so easily, but it is a little harrish; Marry it is more proper for Sharpnesse of Urine, and Exulceration of the Bladder, and all manner of Lenifyings. *Womans milke* likewise is prescribed, when all faile; but I commend it not; as being a little too neare the Juyce of Mans Body, to be a good Nourisher; Except it be in *Infants*, to whom it is Naturall.

52

*Oyle* of *Sweet Almonds*, newly drawne, with *Sugar*, and a little *Spice*, spread upon Bread tosted, is an Excellent Nourisher; But then to keepe the *Oyle* from frying in the Stomach, you must drinke a good draught of *Milde Beere* after it; And to keepe it from relaxing the Stomach too much, you must put in a little *Powder* of *Cinnamon*.

53

The *Tolkes* of *Egges* are of themselves so well prepared by Nature for Nourishment; As (so they bee Potched, or Reare boyled) they need no other Preparation, or Mixture; yet they may bee taken also raw, when they are new laid, with *Malmesey*, or *Sweet Wine*; You shall doe well to put in some few Slices of *Eringium Roots*, and a little *Amber-grice*; For by this meanes, besides the immediate Facultie of Nourishment, such Drinke will strengthen the Back; So that it will not draw down the *Vrine* too fast; For too much *Vrine* doth alwayes hinder Nourishment.

54

*Mincing* of *Meat*, as in *Pies*, and *Buttered Minced Meat*, saveth the Grinding of the Teeth; And therefore, (no doubt) it is more Nourishing; Especially in Age; Or to them that have weake Teeth; But the Butter is not so proper for weake Bodies; And therefore it were good to moisten it with a little *Claret Wine*, *Pill* of *Limon*, or *Orenge*, cut small, *Sugar*, and a very little *Cinnamon*, or *Nutmegg*. As for *Chuetts*, which are likewise minced *Meat*, in stead of Butter, and Fat, it were good to moisten them, partly with *Creame*, or *Almond*, or *Pistachomilke*; or *Barley*, or *Maiz Creame*; Adding a little *Coriander Seed*, and *Carraway Seed*, and a very little *Saffron*. The more full Handling of *Alimentation* we reserve to the due place.

*We have hitherto handled the Particulars which yeeld best, and easiest, and plentifullest Nourishment; And now we will speake of the best Meanes of Conveying, and Converting the Nourishment.*

55

The First *Meanes* is, to procure that the Nourishment may not bee robbed, and drawne away; wherein that, which we have already said, is very Materiall; To provide, that the *Reines* draw not too strongly an over-great Part of the *Bloud* into *Vrine*. To this adde that Precept of *Aristotle*, that *Wine* bee forborne in all *Consumptions*; For that the *Spirits* of the *Wine*, doe prey upon the *Rosside Juyce* of the Body, and inter-common with the *Spirits* of the Body, and so deceive and robbe them of their Nourishment. And therefore if the *Consumption* growing from the weaknesse of the Stomach, doe force you to use *Wine*, let it alwayes be burnt; that the Quicker *Spirits* may evaporate, or at the least quenched with two little wedges of *Gold*, 6 or 7 times repeated. Adde also this Proviso, that there be not too much *Expence* of



of the *Nourishment*, by *Exhaling*, and *Sweating*: And therefore if the Patient be apt to sweat, it must be gently restrained. But chiefly *Hippocrates* Rule is to be followed, who adviseth quite contrary to that which is in use: Namely, that the *Linnen*, or *Garment* next the *Flesh*, be in *Winter* drie, and oft changed; And in *Summer* seldome changed, and smeared over with *Oyle*; For certaine it is, that any Substance that is fat, doth a little fill the Pores of the Body, and stay Sweat, in some Degree. But the more cleanly way is, to have the *Linnen* smeared lightly over, with *Oyle of Sweet Almonds*; And not to forbear shifting as oft as is fit.

The Second *Meane* is, to send forth the *Nourishment* into the *Parts*, more strongly; For which, the working must bee by *Strengthening* of the *Stomach*; And in this, because the *Stomach* is chiefly comforted by *Wine*, and *Hot things*, which otherwise hurt, it is good to resort to *Outward Applications* to the *Stomach*: Wherein it hath beene tryed, that the *Quilts* of *Roses*, *Spices*, *Masticke*, *Wormewood*, *Mint*, &c. are nothing so helpfull, as to take a *Cake* of *New bread*, and to bedew it with a little *Sack*, or *Alegant*; And to drie it, And after it be dried a little before the *Fire*, to put it within a cleane *Napkin*, and to lay it to the *Stomach*: For it is certaine, that all *Flower* hath a potent Vertue of *Astringion*; In so much as it hardeneth a peece of *flesh*, or a *Flower*, that is laid in it: And therefore a *Bagg* quilted with *Bran*, is likewise very good; but it drieth somewhat too much; and therefore it must not lie long.

The Third *Meane* (which may be a branch of the former) is to send forth the *Nourishment* the better by *Sleepe*. For we see, that *Beares*, and other *Creatures* that *sleep* in the *Winter*, wax exceeding fat: And certaine it is, (as it is commonly beleevd) that *Sleep* doth *Nourish* much; Both for that the *Spirits* doe lesse spend the *Nourishment* in *Sleep*, than when living *Creature* are awake: And because (that which is to the present purpose) it helpeth to thrust out the *Nourishment* into the *Parts*. Therefore in *Aged men*, and weake *Bodies*, and such as abound not with *Choller*, a short *Sleep* after dinner doth helpe to *Nourish*; For in such *Bodies* there is no feare of an over-hasty *Digestion*, which is the Inconvenience of *Postmeridian sleeps*. *Sleepe* also in the Morning after the taking of somewhat of easie *Digestion*; As *Milke* from the *Cow*, *Nourishing Broth*, or the like; doth further *Nourishment*: But this would be done, sitting upright, that the *Milke* or *Broth* may passe the more speedily to the bottome of the *Stomach*.

The Fourth *Meane* is to provide that the *Parts* themselves may draw to them the *Nourishment* strongly. There is an Excellent Observation of *Aristotle*; That a great reason, why plants (some of them) are of greater Age, than *Living Creatures*, is, for that they yearly put forth new *Leaves*, and *Boughes*; whereas *Living Creatures* put forth (after their Period of Growth,) nothing that is young, but *Haire* and *Nails*, which are *Excrements*, and no *Parts*. And it is most certaine, that whatsoever is young, doth draw *Nourishment* better, than that which is Old; And then (that which is the *Mysterie* of that Observation) young *Boughes*, and *Leaves*, calling the *Sap* up to them; the same *Nourisheth* the *Body*, in the *Passage*. And this we see notably proved also, in that the oft cutting, or Polling of *Hedges*, *Trees*, and *Herbs*, doth conduce much to their *Lasting*. Transfere therefore this Observation to the Helping of *Nourishment* in *Living Creatures*: The Noblest and Principall Use whereof is, for the *Prolongation* of *Life*; *Restauration* of some Degree of *Youth*; and *Inteneration* of the *Parts*: For certaine it is, that there are in *Living Creatures* *Parts* that *Nourish*, and *Repaire* easily; And *Parts* that



Nourish and Repaire hardly; And you must refresh, and renew those that are easie to Nourish, that the other may be refreshed, and (as it were) Drink in Nourishment, in the Passage. Now wee see that *Draught Oxen*, put into good Pasture, recover the Fleish of young Beeffe, And Men after long Emaciating Diets, wax plump, and fat, and almost new: So that you may surely conclude, that the frequent and wise Use of those *Emaciating Diets*, and of *Purgings*; And perhaps of some kinde of *Bleeding*; is a principall Meanes of *Prolongation of Life*; & *Restoring* some Degree of *Youth*: For as we have often said, *Death* commeth upon *Living Creatures* like the Torment of *Mezentius*.

*Mortua quinetiam jungebat Corpora vivis,*

*Componens Manibusque Manus, atque Oribus Ora.*

For the Parts in Mans Body easily reparable, (as *Spirits*, *Bloud*, and *Flesh*) die in the Embrace of the Parts hardly reparable, (as *Bones*, *Nerves*, and *Membranes*;) And likewise some *Entrails* (which they reckon amongst the *Spermatieall Parts*) are hard to repaire: Though that Division of *Spermatieall*, and *Menstruall Parts*, be but a Conceit. And this same *Observation* also may be drawne to the present purpose of Nourishing Emaciated Bodies: And therefore *Gentle Friction* draweth forth the Nourishment, by making the Parts a little hungry, and heating them; whereby they call forth Nourishment the better. This *Friction* I wish to be done in the Morning. It is also best done by the *Hand*, or a peece of *Scarlet wooll*, wet a little with *Oile of Almonds*, mingled with a small Quantitie of *Bay-Salt*, or *Saffron*; We see that the very Currying of *Horses* doth make them fat, and in good liking.

59

The fifth Meanes is, to further the very *Act*, of *Assimilation* of Nourishment; which is done by some outward *Emollients*, that make the Parts more apt to *Assimilate*. For which I have compounded an *Ointment* of Excellent Odour, which I call *Roman Ointment*, vide the *Receit*. The use of it would be betweene Sleeps; For in the latter Sleepe the Parts *Assimilate* chiefly.

Experiment  
Solitary touch-  
ing *Filum*  
*Medicinale*.

60

There be many *Medicines*, which by themselves would doe no Cure, but perhaps Hurt; but being applyed in a certaine Order, one after another, doe great Cures. I have tryed (my selfe) a *Remedy* for the *Gout*, which hath seldome failed, but driven it away in 24. Houres space: It is first to apply a *Pulvisse*; Of which vide the *Receit*; And then a *Bath* or *Fomentation*, of which vide the *Receit*; And then a *Plaister*, vide the *Receit*. The *Pulvisse* relaxeth the Pores, and maketh the Humour apt to Exhale. The *Fomentation* calleth forth the Humour by Vapours; But yet in regard of the way made by the *Pulvisse*, Draweth gently; And therefore draweth the Humours out; and doth not draw more to it; For it is a *Gentile Fomentation*, and hath withall a Mixture, (though very little) of some *Stupefactive*. The *Plaister* is a Moderate *Astringent Plaister*, which repelleth New Humour from falling. The *Pulvisse* alone would make the Part more soft, and weake; And apter to take the Defluxion and Impression of the Humour. The *Fomentation* alone, if it were too weake, without way made by the *Pulvisse*, would draw forth little; If too strong, it would draw to the Part, as well as draw from it. The *Plaister* alone, would pen the Humour already contained in the Part, and so exasperate it, as well as forbid new Humour. Therefore they must be all taken in Order, as is said. The *Pulvisse* is to be laid to, for two or three Houres: The *Fomentation* for a Quarter of an Houre, or somewhat better, being used hot, and seven or eight times repeated: The *Plaister* to continue on still, till the Part be well confirmed.

There



**T**Here is a secret Way of Cure, (unpractized;) By *Assuetude* of that which in it selfe hurteth. *Poysons* have beene made, by some, Familiar, as hath beene said. *Ordinary keepers* of the *Sicke* of the *Plague*, are seldome infected. *Enduring* of *Tortures*, by *Custom*, hath been made more easie: The *Brooking* of *Enormous Quantity* of *Meats*, and so of *wine* or *Strong Drinke*, hath beene, by *Custom*, made to bee without *Surfet*, or *Drunkennesse*. And generally *Diseases* that are *Chronicall*, as *Coughes*, *Phthisickes*, some kindes of *Palseyes*, *Lunacies*, &c. are most dangerous at the first: Therefore a wise *Physitian* will consider whether a *Disease* bee *Incurable*; Or whether the *Iust Cure* of it bee not full of perill; And if hee finde it to bee such, let him resort to *Palliation*; And alleviate the *Symptome*, without busying himselfe too much with the perfect *Cure*: And many times, (if the *Patient* bee indeed patient,) that *Course* will exceed all *Expectation*. Likewise the *Patient* himselfe may strive, by little and little, to *Overcome* the *Symptome*, in the *Exacerbation*, and so, by time, turne *Suffering* into *Nature*.

**D**ivers *Diseases*, especially *Chronicall*, (such as *Quartian Agues*;) are sometimes cured by *Surfet*, and *Excesses*: As *Excesse* of *Mear*, *Excesse* of *Drinke*, *Extraordinary Fasting*, *Extraordinary Stirring*, or *Lassitude*, and the like. The *Cause* is, for that *Diseases* of *Continuance* get an *Adventitious Strength* from *Custom*, besides their *Materiall Cause* from the *Humors*: So that the *Breaking* of the *Custom* doth leave them onely to their first *Cause*; which if it be any thing weak will fall off. Besides, such *Excesses* doe *Excite* and *Spur Nature*, which thereupon riseth more forcibly against the *Disease*.

**T**Here is in the *Body* of *Man* a great *Consent* in the *Motion* of the severall *Parts*. Wee see, it is *Childrens sport*, to prove whether they can rubbe upon their *Brest* with one hand, and pat upon their *Fore-head* with another; And straight wayes they shall sometimes rubbe with both *Hands*, or pat with both hands. Wee see, that when the *Spirits*, that come to the *Nostrils*, expell a bad *Sent*, the *Stomach* is ready to *Expell* by *Vomit*. We findethat in *Consumptions* of the *Lungs*, when *Nature* cannot expell by *Cough*, *Men* fall into *Fluxes* of the *Belly*, and then they die. So in *Pestilent Diseases*, if they cannot be expelled by *Sweat*, they fall likewise into *Loosenesse*, and that is commonly *Mortall*. Therefore *Physitians* should ingeniously contrive, how by *Motions* that are in their *Power*, they may excite *Inward Motions* that are not in their *Power*, by *Consent*: As by the *Stench* of *Feathers*, or the like, they cure the *Rising* of the *Mother*.

**H**ippocrates *Aphorisme*, In *Morbis minus*, is a good profound *Aphorisme*. It importeth, that *Diseases*, contrary to the *Complexion*, *Age*, *Sex*, *Season of the yeare*, *Diet*, &c. are more dangerous than those that are *Concurrent*. A *Man* would thinke it should bee otherwise; For that, when the *Accident* of *Sicknesse*, and the *Naturall Disposition*, doe second the one the other, the *Disease* should bee more forcible: And so (no doubt) it is; if you suppose like *Quantity* of *Matter*. But that which maketh good the *Aphorisme*, is, Because such *Diseases* doe shew a greater *Collection* of *Matter*, by that they are able to overcome those *Naturall Inclinations* to the *Contrary*. And therefore in *Diseases* of that kinde, let the *Physitian* apply himselfe more to *Purgation*, than to *Alteration*; Because the offence is in the *Quantity*, and the *Qualities* are rectified of themselves.

Experiment  
Solitary touch-  
ing Cure by  
Custom.

61

Experiment  
Solitary touch-  
ing Cure by  
Excesse.

62

Experiment  
Solitary touch-  
ing Cure by  
Motion of Con-  
sent.

63

Experiment  
Solitary touch-  
ing Cure of  
Diseases which  
are contrary to  
Predisposition.

64



Experiment  
Solitary tou-  
ching Prepara-  
tions before  
Purging, and  
Setling of the  
Body afterward  
65

**P**hysicians do wisely prescribe, that there bee *Preparatives* used before *Iust Purgations*; For certaine it is, that *Purgers* doe many times great Hurt, if the Body bee not accommodated, both before, and after the *Purging*. The Hurt that they doe, for want of *Preparation* before *Purging*, is by the Sticking of the Humours, and their not comming faire away; Which causeth in the Bodie great Perturbations, and ill Accidents, during the *Purging*; And also, the diminishing, and dulling of the Working of the *Medicine* it selfe, that it purgeth not sufficiently; Therefore the worke of *Preparation* is double; to make the *Humours* fluide, and mature; And to make the *Passages* more open: For both those helpe to make the Humours passe readily. And for the former of these, *Sirrups* are most profitable; And for the Latter, *Apozumes*, or *Preparing Broihs*; *Clisters* also helpe lest the *Medicine* stop in the Guts, and worke gripingly. But it is true, that *Bodies* abounding with *Humours*; And *fat Bodies*; And *Open weather*; are *Preparatives* in themselves; because they make the Humours more fluide. But let a *Physitian* beware, how hee purge after hard *Frosty weather*, and in a *Leane Body*, without *Preparation*. For the Hurt, that they may doe after *Purging*; It is caused by the Lodging of some *Humours* in ill Places: For it is certaine, that there bee *Humours*, which somewhere placed in the Body, are quiet, and doe little hurt; In other Places, (especially *Passages*;) do much mischief. Therefore it is good, after *Purging*, to use *Apozumes*, and *Broihs*, not so much *Opening* as those used before *Purging*, but *Absterfive* and *Mundifying Clisters* also are good to conclude with, to draw away the Reliques of the Humours, that may have descended to the *Lower Region* of the Bodie.

Experiment  
Solitary rou-  
ching Stanch-  
ing of Bloud.  
66

**B**lood is stanch'd divers wayes. First by *Astringents*, and *Repercussive Medicines*. Secondly by *Drawing* of the *Spirits* and *Bloud* inwards; which is done by cold; As *Iron* or a *Stone* laid to the neck doth stanch the Bleeding at the Nose; also it hath been tryed, that the *Testicles* being put into sharp *Vineger*, hath made a suddaine *Recessse* of the *Spirits*, and stanch'd *Bloud*. Thirdly by the *Recessse* of the bloud by *Sympathy*. So it hath beene tryed, that the part that bleedeth, being thrust into the Body of a *Capon*, or *Sheepe*, new ript and bleeding, hath stanch'd *Bloud*; The *Bloud*, as it seemeth, sucking & drawing up, by similitude of substance, the *Bloud* it meeteth with, and so it selfe going backe. Fourthly by *Custom* and *Time*; So the Prince of *Aurange*, in his first hurt, by the *Spanish Boy*, could finde no meanes to stanch the *Bloud*, either by *Medicine* or *Ligament*; but was faine to have the *Orifice* of the wound stopped by *Mens Thumbs*, succeeding one another, for the space at the least of two Dayes; And at the last the bloud by *Custom* onely retired. There is a fifth Way also in use, to let *Bloud* in an *Adverse Part*, for a *Revulsion*.

Experiment  
Solitary rou-  
ching Change  
of Aliments  
and Medicines.  
67

**I**t helpeth, both in *Medicine*, and *Aliment*, to Change and not to continue the same *Medicine* and *Aliment* still. The Cause is, for that *Nature* by continuall Use of any Thing, groweth to a *Sacietie*, and *Dulnesse*, either of *Appetite*, or *Working*. And we see that *Assuetude* of *Things* Hurtfull doth make them leese their force to Hurt; As *Poyson*, which with use some have brought themselves to brook. And therefore it is no marvaile, though *Things* helpfull by *Custom*, leese their force to Helpe, I count *Intermission* almost the same thing with *Change*; For that, that hath beene intermitted, is after a sort new.



IT is found by Experience, that in *Diets of Guaiacum, Sarza*, and the like (especially if they be strict,) the *Patient* is more troubled in the beginning, than after continuance; Which hath made some of the more delicate Sort of patients, give them over in the midst; Supposing that if those *Diets* trouble them so much at first, they shall not be able to endure them to the End. But the Cause is, for that all those *Diets*, doe drie up *Humours, Rheumes*, and the like; And they cannot Drie up untill they have first attenuated; And while the *Humour* is attenuated, it is more Fluid, than it was before, and troubleth the Body a great deale more, untill it bee dried up, and consumed. And therefore *Patients* must expect a due time, and not check at them at the first.

Experiment  
Solitary touch-  
ing *Diets*.  
68

THE Producing of Cold is a thing very worthy the Inquisition; both for Use, and Disclosure of Causes. For *Heat* and *Cold* are *Natures* two hands, whereby she chiefly worketh: And *Heat* we have in readinesse, in respect of the *Fire*; But for *Cold* we must stay till it commeth; or seeke it in deep Caves, or high Mountaines: And when all is done, wee cannot obtaine it in any great degree: For *Furnaces of Fire* are farre hotter, than a *Summers Sunne*; But *Vaults* or *Hills* are not much Colder than a *Winters Frost*.

Experiments  
in Consort  
touching the  
Production of  
Cold.

The first *Meanes of Producing Cold*, is that which *Nature* presenteth us withall; Namely the Expiring of cold out of the *Inward Parts of the Earth* in *Winter*, when the *Sunne* hath no power to overcome it; the *Earth* being (as hath been noted by some) *Primum Frigidum*. This hath been asserted, as well by Ancient, as by Moderne *Philosophers*: It was the Tenet of *Parmenides*. It was the opinion of the *Autor* of the discourse in *Plutarch*, (for I take it, that booke was not *Plutarchs* owne) *De primo Frigido*. It was the opinion of *Telesius*, who hath renewed the *Philosophie* of *Parmenides*, and is the best of the *Novelists*.

69

The second Cause of Cold is the Contact of Cold Bodies; For Cold is Active and Transitive into Bodies Adjacent, as well as Heat: which is seen in those things that are touched with Snow or Cold water. And therefore, who-soever will bee an *Inquirer* into *Nature*, let him resort to a *Conservatory* of Snow and Ice; Such as they use for delicacy, to coole Wine in Summer: Which is a Poore and Contemptible use, in respect of other uses, that may bee made of such *Conservatories*.

70

The Third Cause is the Primary Nature of all *Tangible Bodies*: For it is well to be noted, that all Things whatsoever (*Tangible*) are of themselves Cold; Except they have an Accessory Heat by fire; Life; or Motion: For even the Spirit of wine, or Chymicall Oyles, which are so hot in Operation, are to the first Touch, Cold; And Aire it selfe compressed, and Condensed a little by blowing, is Cold.

71

The Fourth Cause is the Density of the Body; For all Dense Bodies are Colder than most other Bodies; As Metals, Stone, Glasse; and they are longer in Heating than Softer Bodies. And it is certaine, that *Earth*, Dense, *Tangible*, hold all of the Nature of Cold. The Cause is, for that all *Matters Tangible* being Cold, it must needs follow, that where the Matter is most Congregate, the Cold is the greater.

72

The



73

The Fifth Cause of Cold, or rather of increase and vehemency of Cold, is a *Quick Spirit inclosed in a Cold Body*: As will appeare to any that shall attentively consider of Nature in many Instances. Wee see *Nitre* (which hath a *Quick Spirit*) is Cold; more Cold to the Tongue, than a Stone; So *Water* is Colder than *Oile*, because it hath a *Quicker Spirit*; For all *Oile*, though it hath the Tangible Parts better digested than *Water*, yet hath it a duller *Spirit*: So *Snow* is Colder than *Water*, because it hath more *Spirit* within it: So wee see that *Salt* put to *Ice* (as in the producing of the *Artificiall Ice*) increaseth the Activity of Cold: So some *Insecta* which have *Spirit of Life*, as *Snakes*, and *Silkwormes*, are to the touch, Cold. So *Quick-silver* is the Coldest of Metals, because it is fullest of *Spirit*.

74

The Sixth Cause of Cold is the Chasing and Driving away of *Spirits*, such as have some Degree of Heat: For the Banishing of the Heat must needs leave any Body Cold. This wee see in the Operation of *Opium*, and *Suipersatives*, upon the *Spirits* of living Creatures: And it were not amiss to trie *Opium*, by laying it upon the Top of a *weather-glasse*, to see whether it will contract the *Ayre*: But I doubt it will not succeed: For besides that the vertue of *Opium* will hardly penetrate thorow such a Body as *Glasse*, I conceive that *Opium*, and the like, make the *Spirits* flie rather by *Malignity*, than by Cold.

75

Seventhly, the same Effect must follow upon the *Exhaling* or *Drawing out* of the warme *Spirits*, that doth upon the Flight of the *Spirits*. There is an Opinion, that the *Moone* is Magneticall of Heat, as the *Sunne* is of Cold and *Moisture*: It were not amiss therefore to trie it, with *Warme-waters*; The one exposed to the Beames of the *Moone*, the other with some Skreene betwixt the Beames of the *Moone* and the *water*; As wee use to the *Sunne* for Shade; And to see whether the former will coole sooner. And it were also good to inquire, what other Meanes there may bee, to draw forth the *Exile heat*, which is in the *Ayre*; for that may be a Secret of great Power to Produce Cold weather.

Experiments  
in Confort  
touching the  
Version and  
Transmutation  
of Aire into  
water.

WE E have formerly set down the Meanes of turning *Aire* into *water*, in the Experiment 27. But because it is *Magnale Naturæ*; and tendeth to the subduing of a very great effect; And is also of Manifold use; wee will adde some Instances in Confort that give light thereunto.

76

It is reported by some of the *Ancients*, that *Sailers* have used, every Night, to hang *Fleeces of Wooll* on the sides of their *Ships*, the *Wooll* towards the *water*; And that they have crushed fresh *Water* out of them, in the Morning, for their use. And thus much we have tryed, that a *Quantitie* of *Wooll* tyed loose together, being let downe into a deepe well; And hanging in the Middle, some three Fathome from the *water*, for a night, in the Winter time; increased in weight, (as I now remember) to a fifth Part.

77

It is reported by one of the *Ancients*, that in *Lydia*, neare *Pergamus*, there were certaine *work-men*, in time of *Wars* fled into *Caves*; And the Mouth of the *Caves* being stopped by the *Enemies*, they were famished. But long time after the dead *Bones* were found; And some *Vessels* which they had carried with them; And the *Vessels* full of *water*; And that *water*, thicker, and more towards *Ice*, than *Common water*: which is a Notable Instance of *Condensation*, and *Induration* by *Buriall under Earth*, (in *Caves*) for long time; And of *version* also (as it should seeme,) of *Aire* into *water*;

if



if any of those vessels were Empty. Tria therefore a small *Bladder* hung in *Snow*; And the like in *Nitre*; And the like in *Quick-silver*: And if you finde the *Bladders* fallen, or shrunk; you may bee sure the *Aire* is condensed by the *Cold* of those *Bodies*; As it would bee in a *Cave* under *Earth*.

It is reported of very good credit, that in the *East-Indies*, if you set a Tub of *Water* open in a Roome where *Cloves* are kept, it will bee drawne drie in 24. houres; Though it stand at some distance from the *Cloves*. In the Countrey, they use many times, in deceit, when their *Wooll* is new shorne, to set some *Pail*es of *Water* by, in the same Roome; to increase the weight of the *Wooll*. But it may bee, that the Heat of the *Wooll*, remaining from the body of the *Sheepe*; or the Heat gathered by the lying close of the *Wooll*, helpeth to draw the watry Vapour; But that is nothing to the *Version*.

It is reported also credibly, that *Wooll* new shorne, being laid casuall upon a *Vessell* of *Verjuice*, after some time, had drunke up a great part of the *Verjuice*, though the *Vessell* were whole without any *Flaw*, and had not the Bung-hole open. In this Instance, there is (upon the by) to be noted, the *Percolation*, or *Suing* of the *Verjuice* through the wood; For *Verjuice* of it selfe would never have passed thorow the wood: So as, it seemeth, it must bee first in a kinde of Vapour, before it passe.

It is especially to be noted, that the Cause, that doth facilitate the *Version* of *Aire* into *Water*, when the *Aire* is not in grosse, but subtilly mingled with *Tangible Bodies*, is, (as hath beene partly touched before,) for that *Tangible Bodies* have an Antipathy with *Aire*; and if they finde any *Liquid Body*, that is more dense, neare them, they will draw it: And after they have drawne it, they will condense it more, and in effect incorporate it; For wee see that a *Sponge*, or *Wooll*, or *Sugar*, or a *woollen cloth*, being put but in part, in *Water*, or *Wine*, will draw the *Liquor* higher, and beyond the place: where the *water* or *wine* commeth. Wee see also, that *Wood*, *Lute-strings*, and the like, doe swell in moist Seasons: As appeareth by the *Breaking* of the *Strings*, the *Hard Turning* of the *Pegs*, and the *Hard drawing* forth of *Boxes*, and *Opening* of *Wainscot doores*, which is a kinde of *Infusion*: And is much like to an *Infusion* in *water*, which will make wood to swell: As we see in the *Filling* of the *Chops* of *Boules*, by laying them in *water*. But for that part of these *Experiments*, which concerneth *Attraction*, wee will reserve it to the proper *Title* of *Attraction*.

There is also a *Version* of *Aire* into *water*, seene in the *Sweating* of *Marbles*, and other *Stones*. And of *Wainscot* before and in moist weather: This must be, either by some *Moysture* the *Body* yeeldeth; Or else by the Moist *Aire* thickned against the hard body. But it is plaine, that it is the latter; For that wee see *Wood painted with Oyle Colour*, will sooner gather drops in a moist Night, than *wood* alone: which is caused by the Smoothnesse and Closenesse, which letteth in no part of the Vapour, and so turneth it backe, and thickeneth it into Dew. Wee see also, that *Breathing* upon a *Glasse*, or Smooth body, giveth a Dew; And in *Frosty Mornings* (such as we call *Rime frosts*) you shall finde drops of Dew upon the Inside of *Glasse*-windowes; And the *Frost* it selfe upon the ground, is but a *Version* or *Condensation*, of the Moist vapours of the Night, into a watry substance: *Dewes* likewise, and *Raine*, are but the Returnes of Moist vapours Condensed; The Dew, by the *Cold* onely of the Sunnes departure, which is the gentler *Cold*; *Raine*, by the *Cold* of that, which they call the *Middle Region* of the *Aire*; which is the more violent *Cold*.

It is very probable (as hath beene touched) that that, which will turne

Water

78

79

80

81

82



*Water* into *Ice*, will likewise turne *Aire* some Degree nearer unto *Water*. Therefore trie the Experiment of the Artificiall Turning *Water* into *Ice* (where of we shall speake in another place) with *Aire* in place of *Water*, and the *Ice* about it. And although it bee a greater Alteration to turne *Aire* into *Water*, than *Water* into *Ice*: Yet there is this Hope, that by Continuing the *Aire* longer time, the effect will follow; For that Artificiall Conversion of *Water* into *Ice*, is the worke of a few Houres; And this of *Aire* may be tried by a Moneths space, or the like.

Experiments  
in Confort  
touching In-  
durations of  
Bodies.

**I**nduration, or Lapidification, of Substances more soft, is likewise another degree of Condensation; And is a great Alteration in Nature. The Effecting and Accelerating thereof is very worthy to bee inquired. It is effected by three Meanes. The first is by *Cold*; whose Propertie is to Condense, and constipate, as hath beene said. The Second is by *Heat*; which is not proper but by consequence; For the *Heat* doth attenuate; And by Attenuation doth send forth the Spirit and moister Part of a Body; And upon that, the more grosse of the Tangible Parts doe contract and ferre themselves together; Both to avoid *Vacuum* (as they call it;) And also to Munite themselves against the Force of the *Fire*, which they have suffered. And the Third is by *Assimilation*; when a Hard Body Assimilateth a Soft, being contiguous to it.

The Examples of *Induration*, taking them promiscuously, are many: As the Generation of *Stones* within the Earth, which at the first are but Rude Earth, or Clay: And so of *Minerals*, which come (no doubt) at first, of Juyces Concrete, which afterward indurate: And so of *Porcellane*, which is an Artificiall Cement, buried in the Earth a long time: And so the Making of *Bricke*, and *Tile*: Also the Making of *Glasse*, of a certain Sand, and Brake-Roots, and some other Matters: Also the *Exudations* of *Rock-Diamonds*, and *Crystall*, which harden with time: Also the *Induration* of *Bead-Amber*, which at first is a soft Substance; As appeareth by the *Flies*, and *Spiders*, which are found in it; And many more: But we will speak of them distinctly.

83

For *Indurations* by *Cold*, there be few Trials of it; For we have no strong or intense *Cold* here on the Surface of the Earth, so neare the Beames of the Sunne, and the Heavens. The likeliest Triall is by *Snow*, and *Ice*; For as *Snow* and *Ice*, especially being holpen, and their *Cold* activated by *Nitre*, or *Salt*, will turne *Water* into *Ice*, and that in a few houres; So it may be, it will turne *Wood*, or *Stiffe Clay*, into *Stone*, in longer time. Put therefore, into a *Conserving Pit* of *Snow*, and *Ice*, (adding some quantity of *Salt*, and *Nitre*,) a Peece of *Wood*, or a Peece of *Tough Clay*, and let it lie a moneth, or more.

84

Another Triall is by *Metalline Waters*, which have virtuall *Cold* in them.

Put



Put therefore *Wood*, or *Clay*, into *Smiths water*, or other *Metalline water*; And try whether it will not harden in some reasonable time. But I understand it, of *Metalline waters*, that come by *Washing*, or *Quenching*; And not of *Strong Waters* that come by dissolution; for they are too *Corrosive* to consolidate.

It is already found, that there are some *Naturall Spring-waters*, that will *Inlapidate Wood*; So as you shall see one peece of *Wood*, whereof the Part above the *Water* shall continue *Wood*; And the Part under the *Water* shall be turned into a kinde of *Gravelly Stone*. It is likely those *Waters* are of some *Metalline Mixture*; But there would bee more particular Inquiry made of them. It is certaine, that an *Egge* was found, having lien many yeares in the bottome of a *Moat*, where the *Earth* had somewhat overgrown it; And this *Egge* was come to the *Hardnesse* of a *Stone*; And had the *Colours* of the white and yolke perfect: And the *Shell* shining in small graines like *Sugar*, or *Alabaster*.

Another Experience there is of *Induration* by *Cold*, which is already found; which is, that *Metalls*, themselves are hardened by often *Heating* and *Quenching* in *Cold water*: For *Cold* ever worketh most potently upon *Heat* precedent.

For *Induration* by *Heat*, it must be considered, that *Heat*, by the *Exhaling* of the *Moister Parts*, doth either harden the *Bodie*; As in *Bricks*, *Tiles*, &c; Or if the *Heat* be more fierce, maketh the grosser Part it selfe, *Runne* and *Melt*; As in the making of ordinary *Glasse*; And in the *Purification* of *Earth*, (As we see in the *Inner Parts* of *Furnaces*;) And in the *Purification* of *Bricks*; And of *Metals*. And in the former of these, which is the *Hardening* by *baking*, without *Melting*, the *Heat* hath these degrees; First, it *Indurateth*; and then maketh *Fragile*; And lastly it doth *Incinerate* and *Calcinate*.

But if you desire to make an *Induration* with *Toughnesse*, and lesse *Fragilitie*; A middle way would be taken; Which is that which *Aristotle* hath well noted; But would be thoroughly verified. It is, to decoct *Bodies* in *Water*, for two or three dayes; But they must bee such bodies, into which the *Water* will not enter; As *Stone*, and *Metall*. For if they bee *Bodies* into which the *Water* will enter, then long *Seething*, will rather *Soften* than *indurate* them; As hath beene tryed in *Egges*, &c. Therefore, *Softer Bodies* must be put into *Bottles*; And the *Bottles* hung into *Water* seething, with the mouths open, above the *Water*; that no *Water* may get in; For by this Meanes, the *virtuall Heat* of the *Water* will enter; And such a *Heat*, as will not make the *Body* adust, or *fragile*; But the *Substance* of the *Water* will be shut out. This *Experiment* we made; and it sorted thus. It was tryed with a peece of *Free-Stone*, and with *Pewter*, put into the *Water* at large. The *Free-Stone* we found received in some *Water*; For it was softer, and easier to scrape, than a peece of the same *Stone* kept drie. But the *Pewter* into which no *Water* could enter, became more white, and liketo *Silver*, and lesse flexible, by much. There were also put into an *Earthen Bottle*, placed as before, a good *Peller* of *Clay*, a *Peece* of *Cheese*, a *Peece* of *Chalke*, and a *Peece* of *Free-Stone*. The *Clay* came forth almost of the *Hardnesse* of *Stone*; The *Cheese* likewise very hard, and not well to be cut: The *Chalke* and the *Free-Stone* much harder than they were. The colour of the *Clay* inclined not a whit to the Colour of *Brick*, but rather to white, as in ordinary *Drying* by the *Sunne*. Note, that all the former *Trials* were made by a *Boyling* upon a good hot *Fire*, renewing the *Water* as it consumed, with other hot *Water*; But the *Boyling*

85

86

87

88



was but for twelve houres onely; And it is like that the Experiment would have beene more effectually, if the Boyling had been for two or three dayes, as we prescribed before.

89

As touching *Assimilation*, (for there is a degree of *Assimilation* even in Inanimate bodies) wee see Examples of it in some *Stones* in *Clay-Grounds*, lying neare to the top of the Earth, where *Pebble* is; In which you may manifestly see divers *Pebbles* gathered together, and a *Crust* of *Cement* or *Stone* between them, as hard as the *Pebbles* themselves: And it were good to make a *Triall* of purpose, by taking *Clay*, and putting in it divers *Pebble Stones*, thicke set, to see whether in continuance of time, it will not bee harder than other *Clay* of the same lump, in which no *Pebbles* are set. Wee see also in Ruines of old Wals, especially towards the Bottom, the *Mortar* will become as hard as the *Brick*; wee see also, that the *Wood* on the sides of *Vessels* of *Wine*, gathereth a *Crust* of *Tartar*, harder than the *Wood* it selfe; And *Scales* likewise grow to the *Teeth*, harder than the *Teeth* themselves.

90

Most of all, *Induration* by *Assimilation* appeareth in the Bodies of *Trees*, and *living Creatures*: For no *Nourishment* that the *Tree* receiveth, or that the *living Creature* receiveth, is so hard as *Wood*, *Bone*, or *Horne*, &c. but is *Indurated* after by *Assimilation*.

Experiment  
Solitary touching the  
Version of water into  
Aire.

91

THE Eye of the understanding, is like the Eye of the Sense: For as you may see great Objects through small Crannies, or Levels: So you may see great *Axiomes* of *Nature*, through small and Contemptible *Instances*. The *Speedy Depredation* of *Aire* upon watry *Moisture*, and *Version* of the same into *Aire*, appeareth in nothing more visible, than in the sudden Discharge, or vanishing, of a little *Cloud* of *Breath*, or *Vapour*, from *Glasse*, or the *Blade* of a *Sword*, or any such Polished Body; Such as doth not at all Detaine, or Imbibe the *Moisture*; For the *Mistiness* scattereth and breaketh up suddenly. But the like *Cloud*, if it were *Oylie*, or *Fatty*, will not discharge; Not because it sticketh faster; But because *Aire* preyeth upon *Water*, And *Flame*, and *Fire*, upon *Oyle*; And therefore, to take out a Spot of Grease, they use a *Coale* upon browne Paper; Because *Fire* worketh upon Grease, or *Oyle*, as *Aire* doth upon *Water*. And wee see *Paper* oyled, or *Wood* oyled, or the like, last long moist; but *Wet* with *Water*, drie, or putrifie sooner. The Cause is, for that *Aire* medleth little with the *Moisture* of *Oyle*.

Experiment  
Solitary touching the  
Force of Union.

92

THERE is an Admirable demonstration, in the same trifling Instance of the little *Cloud* upon *Glasse*, or *Gemmes*, or *Blades* of *Swords*, of the Force of *Union*, even in the least Quantities, and weakest Bodies, how much it conduceth to Preservation of the present Forme, And the Resisting of a New. For marke well the discharge of that *Cloud*. And you shall see it ever break up, first in the Skirts, and last in the midst. We see likewise, that much *Water* draweth forth the Juice of the Body Infused; But little water, is imbibed by the Body: And this is a Principall Cause, why in Operation upon Bodies, for their *Version* or *Alteration*, the *Triall* in great Quantities, doth not answer the *Triall* in small; And so deceiveth many; For that (I say) the greater Body, resisteth more any Alteration of Forme, and requireth farre greater Strength in the Active Body, that should subdue it.

Experiment  
Solitary touching the  
Producing of Feathers  
and Haires of  
divers Colours.

93

WE have spoken before, in the fifth Instance, of the Cause of *Orient Colours*, in *Birds*; Which is by the Fineness of the Strainer; wee will now endeavour to reduce the same *Axiome* to a *Work*. For this Writing



ting of our *Sylva Sylvarum*, is (to speake properly) not *Naturall History*, but a high kinde of *Naturall Magicke*. For it is not a Description onely of Nature, but a Breaking of Nature, into great and strange Workes. Trie therefore, the Anointing over of *Pigeons*, or other *Birds*, when they are but in their Downe; Or of *whelps*, cutting their Haire as short as may bee; Or of some other Beast; with some oymntment, that is not hurtfull to the Flesh; And that will harden, and stick very close; And see whether it will not alter the Colours of the *Feathers*, or *Haire*. It is received, that the Pulling off, the first *Feathers* of *Birds*, cleane, will make the new come forth *white*: And it is certaine, that *white* is a penurious Colour, and where moisture is scant. So *Blew Violets*, and other *Flowers*, if they be starved, turne Pale and *white*; *Birds*, and *Horses*, by Age, or Scarres, turne *white*: And the *Hoare Haires* of Men, come by the same reason. And therefore in *Birds*, it is very likely, that the *Feathers* that come first, will be many times of divers Colours, according to the Nature of the *Bird*; For that the Skinne is more porous; But when the Skin is more shut, and close, the *Feathers* will come *white*. This is a good *Experiment*, not onely for the Producing of *Birds* and *Beasts* of strange Colours, but also, for the Disclosure of the Nature of Colours themselves; which of them require a finer Porositie, and which a grosser.

IT is a worke of Providence, that hath beene truly observed by some; That the *rolke* of the *Egge*, conduceth little to the *Generation* of the *Bird*; But onely to the *Nourishment* of the same: For if a *Chicken* be opened, when it is new hatched; you shall finde much of the *rolke* remaining. And it is needfull, that *Birds*, that are shaped without the Females Wombe, have in the *Egge*, as well Matter of *Nourishment*, as Matter of generation for the Body. For after the *Egge* is laid, and severed from the Body of the *Hen*; It hath no more *Nourishment* from the *Hen*; But onely a quickning *Heat* when shee sitteth. But *Beasts*, and Men need not the matter of *Nourishment* within themselves; Because they are shaped within the Wombe of the Female, and are *Nourished* continually from her Body.

IT is an Inveterate and received Opinion, that *Cantharides* applyed to any Part of the Body, touch the *Bladder*, and exulcerate it, if they stay on long. It is likewise Received, that a kinde of *Stone*, which they bring out of the *west Indies*, hath a peculiar force to move *Gravell*, and to dissolve the *Stone*; In so much, as laid but to the *Wrest*, it hath so forcibly sent downe *Gravell*, as Men have beene glad to remove it; It was so violent.

It is received and confirmed by daily Experience, that the *Soales* of the *Feet* have great Affinity with the *Head*, and the *Mouth* of the *Stomach*: As wee see, *Going wet-shod*, to those that use it not, affecteth both: Applications of hot *Powders* to the *Feet* attenuate first, and after drie the *Rheume*: And therefore a *Physitian*, that would be Mystically, prescribeth, for the Cure of the *Rheume*, that a Man should walke Continually upon a *Camomill Alley*; Meaning, that he should put *Camomill* within his Sockes. Likewise *Pigeons bleeding*, applyed to the *Soales* of the *Feet*, ease the *Head*: And *Soporiferous Medicines* applyed unto them, provoke *Sleepe*.

It seemeth, that as the *Feet* have a Sympathy with the *Head*; So the *wrests* and *Hands*, have a Sympathy with the *Heart*; Wee see the Affects and Passions of the *Heart*, and *Spirits*, are notably disclosed by the *Pulse*: And it is often tried, that *Juyces* of *Stock-Gilly-Flowers*, *Rose-Campian*, *Garlicke*, and other things; applyed to the *Wrests*, and renewed; have cured long *Agues*.

Experiment  
Solitary touching the  
Nourishment of Living  
Creatures before they be  
brought forth.

94

Experiments  
in Consort touching Sympathy  
and Antipathy for Medicinall use.

95

96

97



And I conceive, that washing with certaine *Liquours*, the *Palmes* of the *Hands*, doth much good: And they doe well in *Heats* of *Agues*, to hold in the *Hands*, *Egges* of *Alabaster*, and *Balls* of *Crystall*.

*Of these things we shall speake more, when wee handle the Title of Sympathy and Antipathy, in the proper Place.*

Experiment  
Solitary touch-  
ing the Se-  
cret Processes of  
Nature.

98

**T**He Knowledge of man (hitherto) hath been determined by the View, or Sight; So that whatsoever is Invisible, either in respect of the *Finenesse* of the *Body* it selfe; Or the *Smallnesse* of the *Parts*; Or of the *Subtiltie* of the *Motion*; is little inquired. And yet these be the Things that Govern Nature principally; And without which, you cannot make any true *Analysis* and *Indication* of the Proceedings of Nature. The *Spirits* or *Pneumaticals*, that are in all *Tangible Bodies*, are scarce knowne. Sometimes they take them for *Vacuum*; whereas they are the most Active of *Bodies*. Sometimes they take them for *Aire*; From which they differ exceedingly, as much as *Wine* from *Water*; And as *Wood* from *Earth*. Sometimes they will have them to be *Naturall Heat*, or a *Portion* of the *Element of Fire*; Whereas some of them are crude, and cold. And sometimes they will have them to be the *Vertues* and *Qualities* of the *Tangible Parts*, which they see, whereas they are Things by themselves. And then, when they come to *Plants* and living *Creatures*, they call them *Soules*. And such Superficiall Speculations they have; Like *Prospectives*, that shew things inward, when they are but *Paintings*. Neither is this a *Question* of *Words*, but infinitely materiall in *Nature*. For *Spirits* are nothing else but a *Naturall Body*, rarified to a *Proportion*, and included in the *Tangible Parts* of *Bodies*, as in an *Integument*. And they be no lesse differing one from the other, than the *Dense* or *Tangible Parts*: And they are in all *Tangible Bodies* whatsoever, more or lesse: And they are never (almost) at rest: And from them, and their *Motions*, principally proceed *Arefaction*, *Colligation*, *Concoction*, *Maturation*, *Putrefaction*, *Vivification*, and most of the Effects of *Nature*: For, as we have figured them in our *Sapientia Veterum*, in the *Fable* of *Proserpina*, you shall in the *Infernall Regiment* heare little Doings of *Pluto*, but most of *Proserpina*: For *Tangible Parts* in *Bodies* are *Stupide* things; And the *Spirits* doe (in effect) all. As for the differences of *Tangible Parts* in *Bodies*, the industry of the *Chymists* hath given some light, in discerning by their *Separations*, the *Oily*, *Crude*, *Pure*, *Impure*, *Fine*, *grosse* *Parts* of *Bodies*, and the like. And the *Physitians* are content to acknowledge, that *Herbs* and *Drugs* have divers *Parts*; As that *Opium* hath a *Stupefactive* *Part*, and a *Heating* *Part*; The one moving *Sleepe*, the other a *Sweat* following; And that *Rubarb* hath *Purging* *Parts*, and *Astringent* *Parts*, &c. But this whole *Inquisition* is weakly and *Negligently* handled. And for the more subtill differences of the *Minute Parts*, and the *Posture* of them in the *Body*, (which also hath great Effects) they are not at all touched: As for the *Motions* of the *Minute Parts* of *Bodies*, which doe so great Effects, they have not beene observed at all; because they are *Invisible*, and incurre not to the *Eye*; but yet they are to be deprehended by *Experience*: As *Democritus* said well, when they charged him to hold, that the *World* was made of such little *Moats*, as were seene in the *Sunne*; *Atomus* (saith he) *necessitate Rationis & Experientia esse convincitur; Atomum enim nemo unquam vidit.* And therefore the *Tumult* in the *Parts* of *Solide Bodies*, when they are compressed, which is the Cause of all *Flight* of *Bodies* thorow the *Aire*, and of other *Mechanicall Motions*, (as hath beene partly touched before, and shall be thoroughly handled in due place,) is not seene

at



at all. But neverthelesse, if you know it not, or enquire it not attentively and diligently, you shall never be able to discern, and much lesse to produce, a Number of *Mechanicall Motions*. Again, as to the *Motions Corporall*, within the Enclosures of Bodies, whereby the Effects (which were mentioned before) passe between the *Spirits*, and the *Tangible Parts*; (which are, *Arefaction*, *Colliquation*, *Concoction*, *Maturation*, &c.) they are not at all handled. But they are put off by the Names of *Verities*, and *Natures*, and *Actions*, and *Passions*, and such other *Logicall Words*.

**I**T is certaine, that of all *Powers in Nature*, *Heat* is the chiefe; both in the Frame of *Nature*, and in the workes of *Art*. Certaine it is likewise, that the Effects of *Heat*, are most advanced, when it worketh upon a Body, without losse or dissipation of the Matter; for that ever betrayeth the Account. And therefore it is true, that the power of *Heat* is best perceived in *Distillations*, which are performed in close Vessels, and Receptacles. But yet there is a higher Degree; For howsoever *Distillations* doe keepe the Body in Cells, and Cloysters, without Going abroad, yet they give space unto Bodies to turne into Vapour; To returne into Liquour; And to Separate one part from another. So as *Nature* doth Expatiate, although it hath not full Liberty: Whereby the true and Ultime Operations of *Heat* are not attained. But if *Bodies* may be altered by *Heat*, and yet no such Reciprocation of *Rarefaction*, and of *Condensation*, and of *Separation*, admitted; then it is like that this *Proteus* of *Matter*, being held by the Sleeves, will turne and change into many *Metamorphoses*. Take therefore a *Square Vessell* of *Iron*, in forme of a Cube, and let it have good thicke and strong Sides. Put into it a Cube of *Wood*, that may fill it as close as may be; And let it have a Cover of *Iron*, as strong (at least) as the Sides; And let it be well Luted, after the manner of the *Chymists*. Then place the *Vessell* within burning *Coales*, kept quicke kindled, for some few houres space. Then take the *Vessell* from the *Fire*, and take off the Cover, and see what is become of the *wood*. I conceive that since all *Inflammation*, and *Evaporation* are utterly prohibited, and the *Body* still turned upon it Selfe, that one of these two Effects will follow: Either that the *Body* of the *Wood* will be turned into a kinde of *Amalgama*, (as the *Chymists* call it;) Or that the *Finer Part* will be turned into *Aire*, and the *Groffer* sticke as it were baked, and incrustate upon the Sides of the *Vessell*, being become of a *Denser Matter*, than the *wood* it selfe, *Crude*. And for another *Triall*, take also *Water*, and put it in the like *Vessell*, stopped as before; But use a gentler *Heat*, and remove the *Vessell* sometimes from the *Fire*; And againe, after some small time, when it is *Cold*, renew the *Heating* of it: And repeat this *Aleration* some few times: And if you can once bring to passe, that the *water*, which is one of the Simplest of Bodies, be changed in Colour, Odour, or Taste, after the manner of Compound Bodies, you may be sure that there is a great Worke wrought in *Nature*, and a Notable Entrance made into strange Changes of Bodies, and productions: And also a Way made, to doe that by *Fire*, in small time, which the *Sunne* and *Age* doe in long time. But of the Admirable Effects of this *Distillation in Close*, (for so we call it) which is like the *Wombes* and *Matrices* of living creatures, where nothing Expireth, nor Separateth; We will speake fully, in the due place; Not that we Aime at the making of *Paracelsus Pigmeys*; Or any such Prodigious Follies; But that we know the Effects of *Heat* will be such, as will scarce fall under the Conceit of Man; If the force of it bee altogether kept in.

Experiment  
Solitary touching the  
Power of Heat.

99



Experiment  
Solitary tou-  
ching the Im-  
possibility of  
Annihilation.

100

There is nothing more Certain in Nature, than that it is impossible for any *Body*, to be utterly *Annihilated*; But that, as it was the worke of the Omnipotency of *God*, to make *Somewhat* of *Nothing*; So it requireth the like Omnipotency, to turne *Somewhat* into *Nothing*. And therefore it is well said, by an Obscure Writer of the *Seet* of the *Chymists*; That there is no such way to effect the Strange *Transmutations* of *Bodies*; as to endeavour and urge by all meanes, the *Reducing* of them to *Nothing*. And herein is contained also a great Secret of Preservation of *Bodies* from Change; For if you can prohibit, that they neither turne into *Aire*, because no *Aire* commeth to them; Nor goe into the *Bodies Adjacent*, because they are utterly Heterogeneall; Nor make a *Round* and *Circulation* within themselves; they will never change, though they be in their Nature never so Perishable, or Mutable. Wee see, how *Flies*, and *Spiders*, and the like, get a *Sepulcher* in *Amber*, more Durable, than the *Monument*, and *Embalming* of the *Body* of any *King*. And I conceive the like will bee of *Bodies* put into *Quick-silver*. But then they must be but thinne; As a leafe, or a peece of *Paper*, or *Parchment*; For if they have a greater *Crafftitude*, they will alter in their own *Body*, though they spend not. But of this, Wee shall speake more, when we handle the *Title* of *Conservation* of *Bodies*.

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# NATVRALL HISTORIE.

## II. Century.



**M**USICKE in the *Practice*, hath beene well pursued; And in good Varietie; But in the *Theory*, and especially in the *Teelding* of the *Causes* of the *Practique*, very weakly; being reduced into certaine Mysticall Subtillties, of no use, and not much Truth. We shall therefore, after our manner, joyne the *Contemplative* and *Active Part* together.

All *Sounds*, are either *Musicall Sounds*, which we call *Tones*; Whereunto there may be an *Harmony*; which *Sounds* are ever *Equall*; As *Singing*, the *Sounds* of *Stringed*, and *Wind-Instruments*, the *Ringing* of *Bels*, &c. Or *Immusicall Sounds*; which are ever *Vnequall*; Such as are the *Voyce* in *Speaking*, all *whisperings*, all *Voyces* of *Beasts*, and *Birds*, (except they bee *Singing Birds*;) all *Percussions*, of *Stones*, *Wood*, *Parchment*, *Skins*, (as in *Drummes*;) and infinite others.

The *Sounds* that produce *Tones*, are ever from such *Bodies*, as are in their *Parts* and *Pores* *Equall*; As well as the *Sounds* themselves are *Equall*; And such are the *Percussions* of *Metall*, as in *Bels*; Of *Glasse*, as in the *Fillipping* of a *Drinking Glasse*; Of *Aire*, as in *Mens voices* whilest they *Sing*, in *Pipes*, *whistles*, *Organs*, *Stringed Instruments*, &c. And of *water*, as in the *Nightingale Pipes* of *Regalls*, or *Organs*, and other *Hydraulicks*; which the *Ancients* had, and *Nero* did so much esteeme, but are now lost. And if any Man think, that the *String* of the *Bow*, and the *String* of the *Viall*, are neither of them *Equall Bodies*; And yet produce *Tones*; he is in an error. For the *Sound* is not created betweene the *Bow* or *Plectrum*, and the *String*; But betweene the *String* and the *Aire*; No more than it is betweene the *Finger* or *Quill*, and the *String*, in other *Instruments*. So there are (in effect) but three *Percussions* that

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Experiments  
in Consort  
touching Mu-  
sicke.

101

102



create *Tones*; *Percussions* of *Metals*, (comprehending *Glasſe*, and the like;) *Percussions* of *Aire*; and *Percussions* of *Water*.

103

The *Diapason* or *Eight* in *Musick* is the sweetest *Concord*; In ſo much, as it is in effect an *Vniſon*; As we ſee in *Lutes*, that are ſtrung in the *Base Strings* with two ſtrings, one an *Eight* above another, which make but as one *Sound*. And every *Eight Note* in *Alcent*, (as from *Eight* to *Fifteene*, from *Fifteene* to *twenty two*, and ſo in *infinitum*;) are but *Scales of Diapason*. The *Cauſe* is darke, and hath not been rendred by any; And therefore would be better contemplated. It ſeemeth that *Aire*, (which is the Subject of *Sounds*) in *Sounds* that are not *Tones*, (which are all *unequall*, as hath been ſaid) admitteth much *Varietie*; As we ſee in the *Voyces* of *Living Creatures*; And likewise in the *Voyces* of ſeverall *Men*; (for we are capable to diſcerne ſeverall *Men* by their *Voyces*;) And in the *Conjugation of Letters*, whence *Articulate Sounds* proceed; Which of all others are moſt various. But in the *Sounds* which we call *Tones*, (that are ever *Equall*) the *Aire* is not able to caſt it ſelfe into any ſuch *varietie*; But is forced to recurre into one and the ſame Poſture or *Figure*, onely differing in *Greatneſſe* and *Smalneſſe*. So we ſee *Figures* may be made of *lines*, *Crooked* and *Straight*, in infinite *Varietie*, where there is *Inequality*; But *Circles*, or *Squares*, or *Triangles Equilaterall*, (which are all *Figures*, of *Equall lines*) can differ but in *Greater*, or *Leſſer*.

104

It is to be noted (the rather leſt any *Man* ſhould thinke, that there is any thing in this *Number of Eight*, to create the *Diapason*;) that this *Computation of Eight*, is a thing rather received, than any true *Computation*. For a true *Computation* ought ever to be, by *Distribution* into *equall Portions*. Now there be interuenient in the *Riſe of Eight* (in *Tones*) two *Beemolls*, or *Halfe-notes*; So as if you diuide the *Tones* equally, the *Eight* is but *Seven* whole and *equall Notes*; And if you ſubdivide that into *Halfe Notes*, (as it is in the *Stops of a Lute*;) it maketh the *Number of thirteene*.

105

Yet this is true; That in the ordinary *Riſes* and *Falls* of the *Voyce of Man*, (not meaſuring the *Tone* by whole *Notes*, and halfe *Notes*, which is the *Equall Meaſure*;) there fall out to be two *Beemolls* (as hath beene ſaid) betweene the *Vniſon* and the *Diapason*: And this *Varying* is naturall. For if a *Man* would endeavour to riſe or fall his *Voyce*, ſtill by *Halfe-Notes*, like the *Stops of a Lute*; or by whole *Notes* alone, without *Halves*; as farre as an *Eight*; hee will not be able to frame his *Voyce* unto it. Which ſheweth, that after every three whole *Notes* Nature requireth, for all *Harmonicall* uſe, one *halfe Note* to be interpoſed.

106

It is to be conſidered, that whatſoever *Vertue* is in *Numbers*, for *Conducing* to *Concent of Notes*, is rather to be aſcribed to the *Ante-number*, than to the *Entire Number*; As namely, that the *Sound* returneth after *Six*, or after *Twelve*; So that the *Seventh*, or the *Thirteenth* is not the *Matter*, but the *Sixth*, or the *Twelfth*; And the *Seventh* and the *Thirteenth* are but the *limits* and *Boundaries* of the *returne*.

107

The *Concords* in *Musicke* which are *Perſect*, or *Semiperſect*, betweene the *Vniſon*, and the *Diapason*, are the *Fifth*, which is the moſt *Perſect*; the *Third* next; And the *Sixth* which is more harſh: And as the *Ancients* eſteemed, and ſo doe my ſelfe and ſome Other yet, the *Fourth* which they call *Diatheſeron*. As for the *Tenth*, *Twelfth*, *Thirteenth*, and ſo in *Infinitum*; they be but *Recurrentes* of the *Former*; viz. of the *Third*, the *Fifth*, and the *Sixth*, being an *Eight* reſpectively from them.

108

For *Discords*, the *Second*, and the *Seventh*, are of all others the moſt odious, in *Harmony*, to the *Senſe*; whereof the *One* is next above the *Vniſon*, the Other



Other next under the *Diapason*: which may shew, that *Harmony* requireth a competent distance of *Notes*.

In *Harmony*, if there be not a *Discord* to the *Base*, it doth not disturb the *Harmony*, though there be a *Discord* to the *Higher Parts*; So the *Discord* be not of the Two that are Odious; And therefore the ordinary *Concent* of *Four* Parts consisteth of an *Eight*, a *Fifth*, and a *Third* to the *Base*: But that *Fifth* is a *Fourth* to the *Treble*, and the *Third* is a *Sixth*. And the *Cause* is, for that the *Base* striking more *Aire*, doth overcome and drowne the *Treble*, (unlesse the *Discord* be very Odious;) And so hideth a small Imperfection. For wee see, that in one of the lower *Strings* of a *Lute*, there soundeth not the *Sound* of the *Treble*, nor any *Mixt Sound*, but onely the *Sound* of the *Base*.

Wee have no *Musick* of *Quarter-Notes*; And it may be, they are not capable of *Harmony*; For we see the *Halfe-Notes* themselves doe but interpose sometimes. Nevertheless we have some *Slides* or *Relishes*, of the *Voyce*, or *Strings*, as it were continued without *Notes*, from one *Tone* to another, rising or falling, which are delightfull.

The *Causes* of that which is *Pleasing*, or *Ingrate* to the *Hearing*, may receive light by that, which is *Pleasing* or *Ingrate* to the *Sight*. There bee two Things *Pleasing* to the *Sight* (leaving *Pictures*, and *Shapes* aside, which are but *Secondary Objects*; And please or displease but in *Memory*;) these two are, *Colours*, and *Order*. The pleasing of *Colour* symbolizeth with the *Pleasing* of any *Single Tone* to the *Eare*; But the *Pleasing* of *Order* doth symbolize with *Harmony*. And therefore we see in *Garden-knots*, and the *Frets* of *Houses*, and all equall and well-answering *Figures*, (as *Globes*, *Pyramides*, *Cones*, *Cylinders*, &c.) how they please; whereas *unequall Figures* are but *Deformities*. And both these *Pleasures*, that of the *Eye*, and that of the *Eare*, are but the *Effects* of *Equality*, *Good Proportion*, or *Correspondence*: So that (out of *Question*) *Equality*, and *Correspondence*, are the *Causes* of *Harmony*. But to finde the *Proportion* of that *Correspondence*, is more abstruse; whereof notwithstanding we shall speake somewhat, (when we handle *Tones*;) in the generall Enquiry of *Sounds*.

*Tones* are not so apt altogether to procure *Sleep*, as some other *Sounds*; As the *Wind*, the *Purling* of *Water*, *Humming* of *Bees*, a *Sweet Voyce* of one that readeth, &c. The *Cause* whereof is, for that *Tones*, because they are Equall, and slide not, doe more strike and erect the *Sense*, than the other. And Overmuch *Attention* hindreth *Sleep*.

There bee in *Musick* certaine *Figures*, or *Tropes*; almost agreeing with the *Figures* of *Rhetorick*; And with the *Affections* of the *Minde*, and other *Senses*. First, the *Division* and *Quavering*, which please so much in *Musick*, have an Agreement with the *Glittering* of *Light*; As the *Moon-Beames* playing upon a *Wave*. Again, the *Falling* from a *Discord* to a *Concord*, which maketh great Sweetnesse in *Musick*, hath an Agreement with the *Affections*, which are reintegrated to the better, after some dislikes: It agreeth also with the *Taste*, which is soone gluttied with that which is sweet alone. The *Sliding* from the *Close* or *Cadence*, hath an Agreement with the *Figure* in *Rhetoricke*, which they call *Præter Expectatum*; For there is a *Pleasure* even in being deceived. The *Report*, and *Fuges*, have an Agreement with the *Figures* in *Rhetoricke*, of *Repetition*, and *Tradition*. The *Tripla's*, and *Changing* of *times*, have an Agreement with the *Changes* of *Motions*; As when *Galliard Time*, and *Measure Time*, are in the *Medley* of one *Dance*.

It hath beene anciently held, and observed, that the *Sense* of *Hearing*, and the *Knives* of *Musick*, have most Operation upon *Manners*; As to *Incourage* Men,



Men, and make them warlike; To make them Soft and Effeminate; To make them Grave; To make them Light; To make them Gentle and inclin'd to Pitty, &c. The Cause is, for that the *Sense of Hearing* striketh the *Spirits* more immediately, than the other *Senses*; And more incorporeally than the *Smelling*: For the *Sight*, *Taste*, and *Feeling*, have their Organs, not of so present and immediate Access to the *Spirits*, as the *Hearing* hath. And as for the *Smelling*, (which indeed worketh also immediatly upon the *Spirits*, and is forcible while the Object remaineth,) it is with a communication of the Breath, or Vapour of the Object *Odorate*: But *Harmony* entring easily, and Mingling not at all, and Comming with a manifest Motion; doth by Custome of often Affecting the *Spirits*, and Putting them into one kinde of Posture, alter not a little the Nature of the *Spirits*, even when the Object is removed. And therefore we see, that *Tunes* and *Aires*, even in their owne Nature, have in themselves some Affinitie with the *Affections*; As there bee *Merry Tunes*, *Dolefull Tunes*, *Solemne Tunes*; *Tunes inclining Mens mindes to Pitty*; *Warlike Tunes*; &c. So as it is no Marvell, if they alter the *Spirits*; considering that *Tunes* have a Predisposition to the Motion of the *Spirits* in themselves. But yet it hath beene noted, that though this variety of *Tunes*, doth dispose the *Spirits* to variety of Passions, conforme unto them; yet generally, *Musick* feedeth that disposition of the *Spirits* which it findeth. Wee see also that severall *Aires*, and *Tunes*, doe please severall *Nations*, and *Persons*, according to the Sympathy they have with their *Spirits*.

Experiments  
in Consort  
touching  
Sounds; and  
first touching  
the Nullity, and  
Entity of  
Sounds.

*Perspective* hath beene with some diligence inquired; And so hath the *Nature of Sounds*, in some sort, as farre as concerneth *Musick*. But the *Nature of Sounds* in generall, hath beene superficially observed. It is one of the subtillest Peeeces of Nature. And besides, I practise, as I doe advise; which is, after long Inquiry of Things, Immerse in Matter, to interpose some Subject, which is Immaterial, or lesse Material; Such as this of *Sounds*; To the end, that the *Intellect* may be Rectified, and become not Partiall.

115

It is first to be considered, what *Great Motions* there are in Nature, which passe without *Sound*, or *Noise*. The *Heavens* turne about, in a most rapide Motion, without *Noise* tous perceived; Though in some *Dreames* they have beene said to make an excellent *Musick*. So the *Motions* of the *Comets*, and *Fiery Meteors* (as *Stella Cadens*, &c.) yeeld no *Noise*. And if it be thought, that it is the Greatnesse of distance from us, whereby the *Sound* cannot be heard; We see that *Lightnings*, and *Coruscations*, which are neare at hand, yeeld no *Sound* neither. And yet in all these, there is a Percussion and Division of the *Aire*. The *Windes* in the *Vpper Region* (which move the *Clouds* above (which we call the *Racke*) and are not perceived below) passe without *Noise*. The *lower Windes* in a *Plaine*, except they be strong, make no *Noise*; But amongst *Trees*, the *Noise*, of such *Windes* will be perceived. And the *Windes* (generally) when they make a *Noise*, doe ever make it unequally, *Rising* and *Falling*, and sometimes (when they are vehement,) *Trembling* at the Height of their *Blast*. *Raine*, or *Haile* falling, (though vehemently,) yeeldeth no *Noise*, in passing through the *Aire*, till it fall upon the *Ground*, *Water*, *Houses*, or the like. *Water* in a *River* (though a swift *Streame*) is not heard in the *Channell*,  
but



but runneth in Silence, if it be of any depth; But the very *Streame* upon *Shal-  
lowes*, of *Gravell*, or *Pebble*, will be heard. And *waters*, when they beat up-  
on the *Shore*, or are straitned, (as in the falls of *Bridges*;) Or are dashed  
against themselves, by *windes*, give a *Roaring Noise*. Any peece of *Timber*, or  
*Hard Body*, being thrust forwards by another *Body* *Contiguous*, without  
knocking, giveth no *Noise*. And so *Bodies* in weighing, one upon another,  
though the *upper Body* presse the *lower Body* downe, make no *Noise*. So the  
*Motion* in the *Minute Parts* of any *Solide Body*, (which is the Principall  
Cause of *Violent Motion*, though unobserved;) passeth without *Sound*; For  
that *Sound*, that is heard sometimes, is produced onely by the Breaking of  
the *Aire*; And not by the Impulsion of the *Parts*. So it is manifest; That  
where the *Anteriour Body* giveth way, as fast as the *Posteriour* cometh  
on, it maketh no *Noise*; be the *Motion* never so great, or swift.

*Aire* open, and at large, maketh no *Noise*, except it bee sharply percussed;  
As in the *Sound* of a *String*, where *Aire* is percussed by a hard, and stiffe  
*Body*; And with a sharp loose; For if the *String* be not straitned, it ma-  
keth no *Noise*. But where the *Aire* is pent, and straitned, there *Breath*, or  
other *Blowing*, (which carry but a gentle *Percussion*;) suffice to create *Sound*;  
As in *Pipes*, and *Winde-Instruments*. But then you must note, that in *Recor-  
ders*, which goe with a gentle *Breath*, the *Concave* of the *Pipe*, were it not for  
the *Fipple*, that straitneth the *Aire*, (much more than the *Simple Concave*;)   
would yeeld no *Sound*. For as for other *Winde-Instruments*, they require a  
forcible *Breath*; As *Trumpets*, *Cornets*, *Hunters-Hornes*, &c. Which appea-  
reth by the blowne *Cheeks* of him that windeth them. *Organs* also are  
blowne with a strong winde, by the *Bellows*. And note againe, that  
some kinde of *Winde-Instruments*, are blowne at a small *Hole* in the side,  
which straitneth the *Breath* at the first *Entrance*; The rather, in respect  
of their *Traverse*, and *Stop* above the *Hole*, which performeth the *Fipples* Part;  
As it is seene in *Flutes*, and *Fifes*, which will not give *Sound*, by a *Blast* at the  
end, as *Recorders*, &c. doe. Likewise in all *whistling*, you contract the  
*Mouth*; And to make it more sharpe, Men sometimes use their *Finger*.  
But in *Open Aire*, if you throw a *Stone*, or a *Dart*, they give no *Sound*: No  
more doe *Bullets*, except they happen to be a little hollowed in the *Casting*;  
Which *Hollownesse* penneth the *Aire*: Nor yet *Arrowes*, except they bee  
ruffled in their *Feathers*, which likewise penneth the *Aire*. As for *Small  
Whistles*, or *Shepheards Oaten Pipes*; they give a *Sound*, because of their ex-  
treme *Slendernesse*, whereby the *Aire* is more pent, than in a *Wider Pipe*.  
Again, the *Voyces* of *Men*, and *Living Creatures*, passe through the throat,  
which penneth the *Breath*. As for the *Iewes Harpe*, it is a sharp *Percussion*;  
And besides, hath the vantage of penning the *Aire* in the *Mouth*.

*Solide Bodies*, if they be very softly percussed, give no *Sound*; As when a *Man*  
treadeth very softly upon *Boards*. So *Chests* or *Doores* in faire weather, when  
they open easily, give no *Sound*. And *Cart-wheeles* squeak not when they are  
liquoured.

The *Flame* of *Tapers*, or *Candles*, though it be a swift *Motion*, and breaketh  
the *Aire*, yet passeth without *Sound*. *Aire* in *Ovens*, though (no doubt) it doth  
(as it were) boyle, and dilate it self, and is repercussed, yet it is without *Noise*.

*Flame* percussed by *Aire*, giveth a *Noise*; As in blowing of the *Fire* by *Bel-  
lowses*; Greater, than if the *Bellowses* should blow upon the *Aire* it selfe.  
And so likewise *Flame* Percussing the *Aire* strongly, (as when *Flame* suddenly  
taketh and openeth,) giveth a *Noise*; So, *Great Flames*, whiles the one im-  
pelleth the other, give a bellowing *Sound*.

There

116

117

118

119



120

There is a Conceit tunneth abroad, that there should be a *white Powder*, which will discharge a Peece without *Noise*; which is a dangerous Experiment, if it should be true: For it may cause secret Murthers. But it seemeth to me impossible; For, if the *Aire pent*, be driven forth, and strike the *Aire open*, it will certainly make a *Noise*. As for the *white Powder*, (if any such thing bee, that may extinguish, or dead the *Noise*;) it is like to bee a Mixture of *Pierre*, and *Sulphur*, without *Coale*. For *Pierre* alone will not take Fire. And if any Manthinke, that the *Sound* may bee extinguished, or deaded, by discharging the *Pent Aire*, before it commeth to the *Mouth* of the *Peece*, and to the *Open Aire*; That is not probable; For it will make more divided *Sounds*: As if you should make a Crosse Barrell hollow, thorow the Barrell of a Peece, it may be, it would give severall *Sounds*, both at the Nose, and at the Sides. But I conceive, that if it were possible, to bring to passe, that there should be no *Aire pent* at the Mouth of the *Peece*, the Bullet might flie with small, or no *Noise*. For first it is certaine, there is no *Noise* in the Percussion of the *Flame* upon the *Bullet*. Next the *Bullet*, in piercing thorow the *Aire*, maketh no *Noise*; As hath beene said. And then, if there be no *Pent Aire*, that striketh upon *Open Aire*, there is no Cause of *Noise*; And yet the Flying of the *Bullet* will not be stayed. For that *Motion* (as hath been oft said) is in the Parts of the *Bullet*, and not in the *Aire*. So as triall must bee made by taking some small *Concave* of *Metall*, no more than you meane to fill with Powder; And laying the *Bullet* in the Mouth of it, halfe out into the *Open Aire*.

121

I heard it affirmed by a Man, that was a great Dealer in Secrets, but hee was but vaine; That there was a *Conspiracy* (which himselfe hindred,) to have killed *Queene Mary*, Sister to *Queen Elizabeth*, by a *Burning Glasse*, when shee walked in *Saint James Parke*, from the Leads of the House. But thus much (no doubt) is true; That if *Burning Glasses* could bee brought to a great strength, (as they talke generally of *Burning-Glasses*, that are able to burne a *Navy*;) the *Percussion* of the *Aire* alone, by such a *Burning-Glasse* would make no *Noise*; No more than is found in *Corruscations*, and *Lightnings*, without *Thunders*.

122

I suppose, that *Impression* of the *Aire* with *Sounds*, asketh a time to bee conveyed to the *Sense*; As well as the *Impression* of *Species visible*. Or else they will not be heard. And therefore, as the *Bullet* moveth so swift, that it is *Invisible*; So the same *Swiftnesse* of *Motion* maketh it *Inaudible*: For wee see, that the *Apprehension* of the *Eye*, is quicker than that of the *Eare*.

123

All *Eruptions* of *Aire*, though small and flight, give an *Entitle of Sound*; which we call *Crackling*, *Puffing*, *Spitting*, &c. As in *Bay-salt*, and *Bay-leaves*, cast into the Fire; So in *Chesnuts*, when they leap forth of the *Ashes*; So in *Greene Wood* laid upon the Fire, especially *Roots*; So in *Candles* that spit *Flame*, if they be wet; So in *Rasping*, *Sneezing*, &c. So in a *Rose-leave* gathered together into the fashion of a *Purse*, and broken upon the *Forehead*, or *Backe* of the *Hand*, as *Children* use.

Experiments  
in Consort  
touching Pro-  
duction, Conser-  
vation, and De-  
lating of Sounds;  
And the Office  
of the Aire  
therein.

124

THE Cause given of *Sound*, that it should be an *Elision* of the *Aire* (whereby, if they meane any thing, they meane a *Cutting*, or *Dividing*, or else an *Attenuating* of the *Aire*) is but a *Terme* of Ignorance: And the *Motion* is but a *Catch* of the *Wit* upon a few *Instances*; As the *Manner* is in the *Philosophy* Received. And it is common with Men, that if they have gotten a *Pretty Expression*, by a *Word* of *Art*, that *Expression* goeth currant; though it be empty of *Matter*. This Conceit of *Elision*, appeareth most manifestly

to



to be false, in that the *Sound* of a *Bell*, *String*, or the like, continueth melting, sometime, after the *Percussion*; But ceaseth straight-ways, if the *Bell*, or *String*, be touched and stayed: whereas, if it were the *Elision* of the *Aire*, that made the *Sound*, it could not bee, that the Touch of the *Bell*, or *String*, should extinguish so suddenly that Motion, caused by the *Elision* of the *Aire*. This appeareth yet more manifestly, by *Chiming* with a Hammer, upon the Out-side of a *Bell*; For the *Sound* will be according to the inward Concave of the *Bell*; whereas the *Elision*, or *Attenuation* of the *Aire*, cannot be but onely betweene the *Hammer*, and the Out-side of the *Bell*. So againe, if it were an *Elision*, a broad *Hammer*, and a *Bodkin*, struck upon Metall, would give a divers *Tone*; As well as a divers *Loudnesse*: But they doe not so; For though the *Sound* of the one be *Louder*, and of the other *Softer*, yet the *Tone* is the same. Besides, in *Eccho's* (whereof some are as loud as the *Originall Voice*,) there is no new *Elision*, but a *Repercussion* onely. But that which convinceth it most of all, is; that *Sounds* are generated, where there is no *Aire* at all. But these and the like Conceits, when Men have cleared their understanding, by the light of Experience, will scatter, and breake up like a Mist.

It is certaine, that *Sound* is not produced at the first, but with some *Locall Motion* of the *Aire*, or *Flame*, or some other *Medium*; Nor yet without some *Resistance*, either in the *Aire*, or the *Body Percussed*. For if there be a meere Yeelding, or Cession, it produceth no *Sound*; As hath beene said. And therein *Sounds* differ from *Light*, and *Colours*; which passe thorow the *Aire*, or other *Bodies*, without any *Locall Motion* of the *Aire*; either at the first, or after. But you must attentively distinguish, between the *Locall Motion* of the *Aire*, (which is but *Vehiculum Causee*, A Carrier of the *Sounds*,) and the *Sounds* themselves, Conveighed in the *Aire*. For as to the former, we see manifestly, that no *Sound* is produced (no not by *Aire* it selfe against other *Aire*, as in *Organs*, &c.) but with a perceptible *Blast* of the *Aire*; And with some *Resistance* of the *Aire* stricken. For even all *Speech*, (which is one of the gentlest *Motions* of *Aire*,) is with *Expulsion* of a little *Breath*. And all *Pipes* have a *Blast*, as well as a *sound*. We see also manifestly, that *Sounds* are carried with *Wind*: And therefore *Sounds* will be heard further with the *Wind*, than against the *Wind*; And likewise doe rise and fall with the *Intension* or *Remission* of the *Wind*. But for the *Impression* of the *Sound*, it is quite another Thing; And is utterly without any *Locall Motion* of the *Aire*, Perceptible; And in that resembleth the *Species Visible*: For after a *Man* hath lured, or a *Bell* is rung, we cannot discerne any *Perceptible Motion* (at all) in the *Aire*, along as the *Sound* goeth; but onely at the first. Neither doth the *Wind* (as farre as it carryeth a *Voice*,) with the *Motion* thereof, confound any of the *Delicate*, and *Articulate Figurations* of the *Aire*, in *Varietie* of *Words*. And if a *Man* speake a good loudnesse, against the *Flame* of a *Candle*, it will not make it tremble much; though most, when those *Letters* are pronounced, which contract the Mouth; As *F*, *S*, *V*, and some others. But Gentle *Breathing*, or *Blowing* without *speaking*, will move the *Candle* farre more. And it is the more probable, that *Sound* is without any *Locall Motion* of the *Aire*, because as it differeth from the *Sight*, in that it needeth a *Locall Motion* of the *Aire* at first; So it paralleleth in so many other things with the *Sight*, and *Radiation* of *Things visible*; Which (without all question) induce no *Locall Motion* in the *Aire*, as hath beene said.

Neverthelesse it is true, that upon the *Noise* of *Thunder*, and great *Ordinance*, Glasse windowes will shake; and Fishes are thought to bee frayed with

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with the Motion, caused by *Noise* upon the water. But these Effects are from the Locall Motion of the *Aire*, which is a Concomitant of the *Sound*, (as hath beene said;) and not from the *Sound*.

127 It hath beene anciently reported, and is still received, that *Extrême Applauses*, and *Shouting of People* assembled in great Multitudes, have so rarified, and broken the *Aire*, that *Birds* flying over, have fallen downe, the *Aire* being not able to support them. And it is beleev'd by some, that *Great Ringing of Bells* in populous Cities, hath chased away *Thunder*: and also dissipated *Pestilent Aire*: All which may bee also from the Concussion of the *Aire*, and not from the *Sound*.

128 A very great *Sound*, neare hand, hath stricken many *Deafe*; And at the Instant they have found, as it were, the breaking of a *Skin* or *Parchment* in their *Eare*: And my Selfe standing neare one that *Lured* loud, and shrill, had suddenly an Offence, as if somewhat had broken, or beene dislocated in my *Eare*; And immediately after, a loud *Ringing*; (Not an ordinary Singing, or Hissing, but farre louder, and differing;) so as I feared some *Deafenesse*. But after some halfe *Quarter* of an *Houre* it vanished. This Effect may be truly referred unto the *Sound*: For (as is commonly received) an over-potent *Object* doth destroy the *Sense*; And *Spiritual Species*; (both *Visible* and *Audible*,) will worke upon the *Sensories*, though they move not any other *Body*.

129 In *Delation of Sounds*, the *Enclosure* of them preserveth them, and causeth them to be heard further. And we find in *Rowles of Parchment*, or *Truncks*, the *Mouth* being laid to the one end of the *Rowle* of *Parchment*, or *Trunk*, and the *Eare* to the other, the *Sound* is heard much further, than in the *Open Aire*. The Cause is, for that the *Sound* spendeth, and is dissipated in the *Open Aire*; But in such *Concaves* it is conserved, and contracted. So also in a *Peece of Ordnance*, if you speake in the *Touch-hole*, and another lay his *Eare* to the *Mouth* of the *Peece*, the *Sound* passeth, and is farre better heard, than in the *Open Aire*.

130 It is further to be considered, how it proveth and worketh, when the *Sound* is not enclosed all the Length of his *Way*, but passeth partly through open *Aire*; As where you speake some distance from a *Truncke*; or where the *Eare* is some distance from the *Truncke*, at the other End; Or where both *Mouth* and *Eare* are distant from the *Truncke*. And it is tried, that in a long *Truncke*, of some eight or tenne foot, the *Sound* is holpen, though both the *Mouth*, and the *Eare* be a handfull, or more, from the Ends of the *Truncke*; And somewhat more holpen, when the *Eare* of the *Hearer* is neare, than when the *Mouth* of the *Speaker*. And it is certaine, that the *Voice* is better heard in a *Chamber* from abroad, than abroad from within the *Chamber*.

131 As the *Enclosure*, that is *Round about* and *Entire*, preserveth the *Sound*; So doth a *Semi-Concave*, though in a lesse degree. And therefore, if you divide a *Truncke*, or a *Cane* into two, and one speake at the one end, and you lay your *Eare* at the other, it will carry the *Voyce* further, than in the *Aire* at large. Nay further, if it be not a full *Semi-Concave*; but if you doe the like upon the *Mast* of a *Ship*, or a long *Pole*, or a *Peece of Ordnance* (though one speake upon the *Surface* of the *Ordnance*, and not at any of the *Bores*;) the *Voice* will be heard further, than in the *Aire* at large.

132 It would bee tried, how, and with what proportion of disadvantage, the *Voyce* will be carried in an *Horne*, which is a line *Arched*; Or in a *Trumpet*, which is a line *Retorted*; Or in some *Pipe* that were *Sinuous*.



It is certaine, (howsoever it crosse the Received Opinion) that *Sounds* may be created without *Aire*, though *Aire* be the most favourable *Deferent* of *Sounds*. Take a *Vessell* of *Water*, and knap a paire of *Tongs* some depth within the *Water*, and you shall heare the *Sound* of the *Tongs* well, and not much diminished; And yet there is no *Aire* at all present.

Take one *Vessell* of *Silver*, and another of *wood*, and fill each of them full of *Water*, and then knap the *Tongs* together, as before, about an handfull from the *Bottome*, and you shall finde the *Sound* much more *Resounding* from the *Vessell* of *Silver*, than from that of *wood*: And yet if there be no *water* in the *Vessell*, so that you knap the *Tongs* in the *Aire*, you shall finde no difference, betweene the *Silver* and the *wooden Vessell*. Whereby, beside the maine point of creating *Sound* without *Aire*, you may collect two *Things*: The one, that the *Sound* communicateth with the *Bottome* of the *Vessell*: The other, that such a *Communication* passeth farre better, thorow *water* than *Aire*.

Strike any *Hard Bodies* together, in the midst of a *Flame*, and you shall heare the *Sound* with little difference, from the *Sound* in the *Aire*.

The *Pneumaticall Part*, which is in all *Tangible Bodies*, and hath some *Affinity* with the *Aire*; performeth, in some degree, the *Parts* of the *Aire*; As when you knock upon an *Empy Barrell*, the *Sound* is (in part) created by the *Aire* on the *Out-side*; And (in part) by the *Aire* in the *Inside*; For the *Sound* will be greater or lesser, as the *Barrell* is more *Empty*, or more *Full*; But yet the *Sound* participateth also with the *Spirit* in the *Wood*, thorow which it passeth, from the *Out-side* to the *Inside*: And so it commeth to passe in the *Chiming* of *Bels*, on the *Outside*; where also the *Sound* passeth to the *Inside*: And a number of other like *Instances*, whereof we shall speak more when we handle the *Communication* of *Sounds*.

It were extreame *Grosseness* to think, (as we have partly touched before, that the *Sound* in *Strings* is made, or produced, betweene the *Hand* and the *String*, or the *Quill* and the *String*, or the *Bow* and the *String*: For those are but *Vehicula motus*, *Passages* to the *Creation* of the *Sound*; the *Sound* being produced betweene the *String* and the *Aire*; And that not by any *Impulsion* of the *Aire* from the first *motion* of the *String*; but by the *Returne* or *Result* of the *String*, which was strained by the *Touch*, to his former *Place*: which *Motion* of *Result* is quick and sharpe; Whereas the first *Motion* is soft and dull. So the *Bow* tortureth the *String* continually, and thereby holdeth it in a *Continuall Trepidation*.

TAKE a *Trunck*, and let one whistle at the one *End*, and hold your *Eare* at the other, and you shall finde the *Sound* strike so sharpe, as you can scarce endure it. The *Cause* is, for that *Sound* diffuseth it selfe in round, And so spendeth it selfe; But if the *Sound*, which would scatter in *Open Aire*, be made to go all into a *Canale*; It must needs give greater force to the *Sound*. And so you may note, that *Enclosures* doe not only preserve *Sound*, but also encrease and sharpen it.

A *Hunters Horne*, being greater at one end, than at the other, doth encrease the *Sound* more, than if the *Horne* were all of an equall *Bore*. The *Cause* is, for that the *Aire*, and *Sound*, being first contracted at the lesser *End*, and afterwards having more *Roome* to spread at the greater *End*, do dilate themselves; And in comming out strike more *Aire*; whereby the *Sound* is the Greater, and *Baser*. And even *Hunters Hornes*, which are sometimes made straight, and not *Oblique*, are ever greater at the lower end. It would

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Experiments in Consort touching the Magnitude, and Exility, and Damps of Sounds.

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be tried also in *Pipes*, being made far larger at the lower End: Or being made with a *Belly* towards the lower End; And then issuing into a straight Concave againe.

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There is in *Saint James's Fields*, a Conduit of Brick, unto which joyneth a low Vault; And at the End of that, a Round House of Stone: And in the Brick Conduit there is a Window; And in the Round House a Slit or Rift of some little breadth: If you cry out in the Rift, it will make a fearfull roaring at the Window. The Cause is the same with the former; For that all Concaves, that proceed from more Narrow to more Broad, do amplifie the Sound at the Comming out.

141

*Hawkes Bells*, that have Holes in the Sides, give a greater Ring, than if the Pellet did strike upon Brasse, in the Open Aire. The Cause is the same with the first Instance of the Trunck; Namely, for that the Sound Enclosed with the Sides of the Bell, commeth forth at the Holes unspent, and more strong.

142

In Drums, the Closeness round about, that preserveth the Sound from dispersing, maketh the Noise come forth at the Drum-Hole, farre more loud, and strong, than if you should strike upon the like Skin, extended in the Open Aire. The Cause is the same with the two precedent.

143

Sounds are better heard, and further off, in an Evening, or in the Night, than at the Noone, or in the Day. The Cause is, for that in the Day, when the Aire is more Thin, (no doubt) the Sound pierceth better; But when the Aire is more Thick (as in the Night) the Sound spendeth and spreadeth abroad lesse: And so it is a Degree of Enclosure. As for the Night, it is true also, that the Generall Silence helpeth.

144

There be two kinds of Reflexions of Sounds; The one at Distance, which is the *Eccho*; Wherein the Originall is heard distinctly, and the Reflexion also distinctly; Of which we shall speak hereafter: The other in Concurrence; When the Sound Reflecting (the Reflexion being neare at hand) returneth immediatly upon the Originall, and so iterateth it not, but amplifieth it. Therefore we see, that Musick upon the Water soundeth more; And so likewise Musick is better in Chambers Wainscotted, than Hanged.

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The Strings of a Lute, or Violl, or Virginals, doe give a farre greater Sound, by reason of the Knot, and Board, and Concave underneath, than if there were nothing but only the Flat of a Board, without that Hollow and Knot, to let in the Upper Aire into the Lower. The Cause is, the Communication of the Upper Aire with the Lower; And Penning of both from Expende, or Dispersing.

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An Irish Harpe hath Open Aire on both sides of the Strings: And it hath the Concave or Belly, not along the Strings, but at the End of the Strings. It maketh a more Resounding Sound, than a Bandora, Orpharion, or Citterne, which have likewise Wire-strings. I judge the Cause to be, for that Open Aire on both Sides helpeth, so that there be a Concave; Which is therefore best placed at the End.

147

In a Virginall, when the Lid is downe, it maketh a more exile Sound, than when the Lid is open. The Cause is, for that all shutting in of Aire, where there is no competent Vent, dampeth the Sound: Which maintaineth likewise the former Instance; For the Belly of the Lute, or Violl, doth pen the Aire somewhat.

148

There is a Church at Gloucester, (and as I have heard the like is in some other places;) where if you speak against a Wall, softly, another shall heare your Voice better a good way off, than neare hand. Enquire more particularly of the Frame of that Place. I suppose there is some Vault, or Hollow,



Hollow, or Isle, behinde the Wall, and some Passage to it towards the further end of that Wall, against which you speak; So as the *Voice* of him that speaketh, slideth along the Wall, and then entreth at some Passage, and communicateth with the *Aire* of the Hollow; For it is preserved somewhat by the plaine Wall; but that is too weak to give a *Sound* Audible, till it hath communicated with the back *Aire*.

Strike upon a *Bow-string*, and lay the *Horne* of the *Bow* neare your Eare, and it will encrease the *Sound*, and make a degree of a *Tone*. The *Cause* is, for that the Sensory, by reason of the Close Holding, is percussed, before the *Aire* disperfeth. The like is, if you hold the *Horne* betwixt your Teeth. But that is a plaine *Delation* of the *Sound*; from the Teeth, to the Instrument of Hearing; For there is a great Entercourse betweene those two Parts; As appeareth by this; That a harsh *grating Tune* setteth the Teeth on edge. The like falleth out, if the *Horne* of the *Bow* be put upon the Temples; But that is but the Slide of the *Sound* from thence to the Eare.

If you take a *Rod* of *Iron*, or *Brasse*, and hold the one end to your Eare, and strike upon the other, it maketh a far greater *Sound*, than the like Stroke upon the *Rod*, not so made Contiguous to the Eare. By which, and by some other *Instances*, that have beene partly touched, it should appeare; That *Sounds* do not only slide upon the Surface of a Smooth Body, but doe also communicate with the Spirits, that are in the Pores of the Body.

I remember in *Trinity Colledge* in *Cambridge*, there was an *Vpper Chamber*, which being thought weak in the Roofe of it, was supported by a Pillar of *Iron*, of the bignesse of ones *Arme*, in the midst of the *Chamber*; which if you had struck, it would make a little flat Noise in the *Room* where it was struck; But it would make a great *Bombe* in the *Chamber* beneath.

The *Sound* which is made by *Buckets* in a *Well*, when they touch upon the *Water*; Or when they strike upon the side of the *Well*; Or when two *Buckets* dash the one against the other; These *Sounds* are deeper, and fuller, than if the like Percussion were made in the *Open Aire*. The *Cause* is the Penning and Enclosure of the *Aire*, in the Concave of the *Well*.

*Barrels* placed in a *Roome* under the Floare of a *Chamber*, make all *Noises* in the same *Chamber*, more full and Resounding.

So that there be five wayes (in generall,) of Majoration of *Sounds*: Enclosure Simple; Enclosure with Dilatation; Communication; Reflexion Concurrent; and Approach to the Sensory.

For *Exility* of the *Voice*, or other *Sounds*: It is certaine, that the *Voice* doth passe thorow *Solid* and *Hard Bodies*, if they be not too thick. And thorow *Water*; which is likewise a very Close Body; and such an one, as letteth not in *Aire*. But then the *Voice*, or other *Sound*, is reduced, by such passage, to a great *Weaknesse*, or *Exility*. If therefore you stop the *Holes* of a *Hawkes Bell*, it will make no Ring, but a flat Noise, or Rattle. And so doth the *Atites*, or *Eagles Stone*, which hath a little Stone within it.

And as for *Water*, it is a certaine Triall: Let a Man go into a *Bath*, and take a *Paile*, and turne the Bottome upward, and carry the Mouth of it (Even,) downe to the Levell of the *Water*, and so presse it downe under the *Water*, some handfull and an halfe, still keeping it even, that it may not tilt on either side, and so the *Aire* get out: Then let him that is in the *Bath*, dive with his Head so far under *Water*, as he may put his Head into the *Paile*; and there will come as much *Aire* bubling forth, as will make Roome for his Head. Then let him speak, and any that shall stand without, shall heare his *Voice* plainly; but yet made extreame sharp and exile, like the *Voice* of

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*Puppets* : But yet the *Articulate Sounds* of the *Words* will not be confounded. Note that it may be much more handsomely done, if the *Paile* be put over the Mans head above *Water*, and then he cower downe, and the *Paile* be pressed downe with him. Note that a Man must kneele or sit, that he may be lower than the *water*. A Man would think, that the *Sicilian Poet* had knowledge of this *Experiment* ; For he saith ; That *Hercules's Page Hylas* went with a *Water-pot*, to fill it at a pleasant *Fountaine*, that was neare the *Shore*, and that the *Nymphs* of the *Fountaine* fell in love with the Boy, and pulled him under *water*, keeping him alive ; And that *Hercules* missing his *Page*, called him by his Name aloud, that all the *Shore* rang of it ; And that *Hylas* from within the *Water*, answered his Master ; But (that which is to the present purpose) with so small and exile a *Voice*, as *Hercules* thought he had beene three Miles off, when the *Fountaine* (indeed) was fast by.

156 In *Lutes*, and *Instruments of Strings*, if you stop a *String* high, (whereby it hath lesse Scope to tremble) the *Sound* is more *Treble*, but yet more dead.

157 Take two *Sawcers*, and strike the Edge of the one against the Bottome of the other, within a *Paile of water* ; And you shall finde, that as you put the *Sawcers* lower, and lower, the *Sound* groweth more flat ; even while Part of the *Sawcer* is above the *Water* ; But that Flatnesse of *Sound* is joyned with a harshnesse of *Sound* ; which (no doubt is caused by the inequality of the *Sound*, which commeth from the Part of the *Sawcer* under the *Water*, and from the Part above. But when the *Sawcer* is wholly under the *Water*, the *Sound* becommeth more cleare, but far more low ; And as if the *Sound* came from afar off.

158 A *Soft Body* dampeth the *Sound*, much more than a *Hard* : As if a *Bell* hath *Cloth*, or *Silk* wrapped about it, it deadeth the *Sound* more, than if it were *Wood*. And therefore in *Clericalls*, the *Keyes* are lined ; And in *Colledges* they use to line the *Tablemen*.

159 Triall was made in a *Recorder*, after these severall manners. The Bottome of it was set against the *Palme* of the *Hand* ; stopped with *Wax* round about, set against a *Damask Cushion* ; Thrust into *Sand* ; into *Ashes* ; into *Water*, (halfe an *Inch* under the *Water* ; ) Close to the Bottome of a *Silver Basin* ; And still the *Tone* remained : But the Bottome of it was set against a *Wollen Carpet* ; A *Lining of Plush* ; A *Lock of Wooll*, (though loosely put in ; ) Against *Snow* ; And the sound of it was quite deaded, and but *Breath*.

160 Iron Hot produceth not so full a *Sound*, as when it is Cold ; For while it is hot, it appeareth to be more Soft, and lesse Resounding. So likewise *Warmed Water*, when it falleth, maketh not so full a *Sound*, as Cold : And I conceive it is softer, and neerer the Nature of *Oile* ; For it is more slippery ; As may be perceived, in that it scowreth better.

161 Let there be a *Recorder* made, with two *Fipples*, at each end one ; The *Trunck* of it of the length of two *Recorders*, and the *Holes* answerable towards each end ; And let two play the same Lesson upon it, at an *Unison* ; And let it be noted whether the *Sound* be confounded ; or amplified ; or dulled. So likewise let a *Crosse* be made, of two *Truncks* (thorowout) hollow ; And let two speak, or sing, the one long wayes, the other traverse. And let two heare at the opposite Ends ; And note, whether the *Sound* be confounded ; amplified ; or dulled. Which two *Instances* will also give light to the *Mixture of Sounds* ; whereof we shall speak hereafter.

162 A *Bellows* blowne in at the *Hole* of a *Drum*, and the *Drum* then stricken, maketh



maketh the *Sound* a little flatter, but no other apparent Alteration. The *Cause* is manifest; Partly for that it hindreth the Issue of the *Sound*; And partly for that it maketh the *Aire*, being blowne together, lesse moveable.

**T**He *Loudnesse*, and *Softnesse* of *Sounds*, is a Thing distinct from the *Magnitude* and *Exilitie* of *Sounds*; For a *Base String*, though softly stricken, giveth the greater *Sound*; But a *Treble String*, if hard stricken, will be heard much further off. And the *Cause* is, for that the *Base String* striketh more *Aire*; And the *Treble* lesse *Aire*, but with a sharper *Percussion*.

It is therefore the *Strength* of the *Percussion*, that is a Principall *Cause* of the *Loudnesse* or *Softnesse* of *Sounds*: As in knocking harder or softer; Winding of a Horne stronger or weaker; Ringing of a Hand-bell harder or softer, &c. And the *Strength* of this *Percussion*, consisteth, as much, or more, in the *Hardnesse* of the *Body Percussed*, as in the *Force* of the *Body Percussing*: For if you strike against a Cloth, it will give a lesse *Sound*; If against Wood, a greater; If against Metall, yet a greater, And in Metals, if you strike against Gold, (which is the more pliant,) it giveth the flatter *Sound*; If against Silver, or Brasse, the more Ringing *Sound*. As for *Aire*, where it is strongly pent, it matcheth a *Hard Body*. And therefore wee see in discharging of a *Peece*, what a great Noise it maketh. Wee see also, that the Charge with Bullet; Or with Paper wet, and hard stopped; Or with Powder alone, rammed in hard; maketh no great difference in the *Loudnesse* of the Report.

The *Sharpnesse* or *Quicknesse* of the *Percussion*, is a great *Cause* of the *Loudnesse*, as well as the *Strength*: As in a Whip or Wand, if you strike the *Aire* with it; the Sharper and Quicker you strike it, the Louder *Sound* it giveth. And in playing upon the *Lute*, or *Virginalls*, the quicke Stroke or Touch, is a great life to the *Sound*. The *Cause* is, for that the Quicke Striking cutteth the *Aire* speedily; whereas the Soft Striking doth rather beat, than cut.

The *Communication* of *Sounds* (as in Bellies of *Lutes*, Empty Vessells, &c.) hath beene touched obiter, in the *Majoration* of *Sounds*: But it is fit also to make a *Title* of it apart.

The *Experiment* for greatest Demonstration of *Communication* of *Sounds*, is the *Chiming* of *Bells*; where if you strike with a Hammer upon the Upper Part, and then upon the Midst, and then upon the Lower, you shall finde the *Sound* to be more Treble, and more Base, according unto the Concave, on the Inside; though the *Percussion* bee onely on the Outside.

When the *Sound* is created betweene the Blast of the *Mouth*, and the *Aire* of the *Pipe*, it hath neverthelesse some *Communication* with the Matter of the Sides of the *Pipe*, and the *Spirits* in them contained; for in a *Pipe*, or *Trumpet*, of Wood, and Brasse, the *Sound* will be divers; So if the *Pipe* be covered with Cloth, or Silke, it will give a divers *Sound*, from that it would doe of it selfe; So, if the *Pipe* bee a little wet on the Inside, it will make a differing *Sound*, from the same *Pipe* dry.

That *Sound* made within *Water*, doth communicate better with a hard Body thorow *Water*, than made in *Aire*, it doth with *Aire*; Vide *Experimentum*, 134.

Wee have spoken before (in the *Inquisition* touching *Musicke*,) of *Musicall Sounds*, whereunto there may be a Concord or

Experiments  
in Consort  
touching the  
*Loudnesse*, or  
*Softnesse* of  
*Sounds*; and  
their Carriage  
at longer or  
shorter Di-  
stance.

163

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Experiments  
in Consort  
touching the  
*Communication*  
of *Sounds*.

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Experiments  
in Consort  
touching  
*Equality*, and  
*Inequality* of  
*Sounds*.



Discord in two Parts; Which Sounds we call *Tones*; And likewise of *Immuscicall Sounds*; And have given the Cause, that the *Tone* proceedeth of *Equality*, and the other of *Inequality*. And wee have also expressed there, what are the *Equall Bodies* that give *Tones*, and what are the *Vnequall* that give none. But now we shall speake of such *Inequalitie* of *Sounds*, as proceedeth, not from the Nature of the Bodies themselves, but is *Accidentall*; Either from the *Roughnesse*, or *Obliquity* of the *Passage*; or from the *Doubling* of the *Percutient*; Or from the *Trepidation* of the *Motion*.

169

A *Bell*, if it have a *Rift* in it, whereby the *Sound* hath not a cleare *Passage*, giveth a *Hoarse* and *Iarring Sound*; So the *Voice* of *Man*, when by *Cold* taken the *Weill* groweth rugged, and (as we call it) furred, becommeth hoarse. And in these two *Instances*, the *Sounds* are *Ingrate*; because they are meere *Vnequall*: But, if they be *Vnequall* in *Equality*, then the *Sound* is *Gratefull*, but *Purling*.

170

All *Instruments*, that have either *Returns*, as *Trumpets*; Or *Flexions*, as *Cornets*; Or are *Drawne up*, and *put from*, as *Sackbuts*; have a *Purling Sound*: But the *Recorder*, or *Flute*, that have none of these *Inequalities*, give a cleare *Sound*. Neverthelesse, the *Recorder* it selfe, or *Pipe* moistened a little in the *Inside*, soundeth more solemnly, and with a little *Purling*, or *Hissing*. Again, a *Wreathed String*, such as are in the *Base Strings* of *Bandoraes*, giveth also a *Purling Sound*.

171

But a *Lute-string*, if it bee meere *Vnequall* in his *Parts*, giveth a *Harsh* and *Untuneable Sound*; which *Strings* wee call *False*, being bigger in one *Place* than in another; And therefore *Wire-strings* are never *False*. Wee see also, that when we trie a *False Lute-string*, we use to extend it hard betweene the *Fingers*, and to fillip it; And if it giveth a double *Species*, it is *True*; But if it giveth a *treble*, or more, it is *False*.

172

*Waters*, in the *Noise* they make as they runne, represent to the *Eare* a *Trembling Noise*; And in *Regals*, (where they have a *Pipe*, they call the *Nightingale-Pipe*, which containeth *Water*) the *Sound* hath a continuall *Trembling*: And *Children* have also little *Things* they call *Cockes*, which have *Water* in them; And when they blow, or whistle in them, they yeeld a *Trembling Noise*; Which *Trembling* of *Water*, hath an *affinitie* with the *Letter L*. All which *Inequalities* of *Trepidation*, are rather pleasant, than otherwise.

173

All *Base Notes*, or very *Treble Notes*, give an *Asper Sound*; For that the *Base* striketh more *Aire*, than it can well strike equally: And the *Treble* cutteth the *Aire* so sharpe, as it returneth too swift, to make the *Sound* Equall: And therefore a *Meane*, or *Tenor*, is the sweetest *Part*.

174

We know Nothing, that can at pleasure make a *Muscicall*, or *Immuscicall Sound*, by voluntary *Motion*, but the *Voice* of *Man*, and *Birds*. The Cause is, (no doubt) in the *Weasill* or *Wind-Pipe*, (which we call *Aspera Arteria*;) which being well extended, gathereth *Equality*; As a *Bladder* that is wrinkled, if it bee extended, becommeth smooth. The *Extension* is alwayes more in *Tones*, than in *Speech*: Therefore the *Inward Voice* or *Whisper* can never give a *Tone*: And in *Singing*, there is (manifestly) a greater *Working* and *Labour* of the *Throat*, than in *Speaking*; as appeareth

in



in the Thrusting out, or Drawing in of the Chinne, when wee sing.

The *Humming* Of Bees, is an *Vaequall Buzzing*; And is conceived, by some of the Ancients, not to come forth at their Mouth, but to bee an *Inward Sound*; But (it may be) it is neither; But from the motion of their Wings; For it is not heard but when they stirre.

All *Metalls quenched* in *water*, give a *Sibilation* or *Hissing Sound*; (which hath an Affinity with the letter *Z.*) notwithstanding the *Sound* bee created betweene the *water* or *Vapour*, and the *Aire*. *Seething* also, if there bee but small Store of *water*, in a Vessell, giveth a *Hissing Sound*; But *Boyling* in a full Vessell, giveth a *Bubling Sound*, drawing somewhat neare to the *Cocks* used by Children.

Triall would be made, whether the *Inequality*, or *Interchange* of the *Medium*, will not produce an *Inequality* of *Sound*; As if three *Bells* were made one within another, and *Aire* betwixt each; And then the outermost *Bell* were chimed with a Hammer, how the *Sound* would differ from a *Simple Bell*. So likewise, take a *Plate* of *Brasse*, and a *Plancke* of *wood*, and joyne them close together, and knock upon one of them, and see if they doe not give an *unequall Sound*. So make two or three *Partitions* of *wood* in a *Hogshead*, with *Holes* or *Knois* in them; And mark the difference of their *Sound*, from the *Sound* of an *Hogshead*, without such *Partitions*.

IT is evident, that the *Percussion* of the *Greater Quantity* of *Aire*, causeth the *Basfer Sound*; And the lesse *Quantity*, the more *Treble Sound*. The *Percussion* of the *Greater Quantity* of *Aire*, is produced by the *Greatnesse* of the *Body Percussing*; By the *Latitude* of the *Concave*, by which the *Sound* passeth; and by the *Longitude* of the same *Concave*. Therefore we see that a *Base string*, is greater than a *Treble*; A *Base Pipe* hath a greater *Bore* than a *Treble*; And in *Pipes*, and the like, the lower the *Note Holes* be, and the further off from the *Mouth* of the *Pipe*, the more *Base Sound* they yeeld; And the nearer the *Mouth*, the more *Treble*. Nay more, if you strike an *Entire Body*, as an *An-diron* of *Brasse*, at the *Top*, it maketh a more *Treble Sound*; And at the *Bottom* a *Basfer*.

It is also evident, that the *Sharper* or *Quicker Percussion* of *Aire* causeth the more *Treble Sound*; And the *Slower* or *Heavier*, the more *Base Sound*. So we see in *Strings*; the more they are wound up, and strained; (And thereby give a more quick *Start-backe*;) the more *Treble* is the *Sound*; And the slacker they are, or lesse wound up, the *Basfer* is the *Sound*. And therefore a *Bigger String* more strained, and a *Lesser String*, lesse strained, may fall into the same *Tone*.

*Children, women, Eunuchs* have more small and shrill *Voyces*, than *Men*. The Reason is, not for that *Men* have greater Heat, which may make the *Voyce* stronger, (for the strength of a *Voyce* or *Sound*, doth make a difference in the *Loudnesse* or *Sofinesse*, but not in the *Tone*;) But from the *Dilatation* of the *Organ*, which (it is true) is likewise caused by Heat. But the Cause of *Changing* the *Voyce*, at the yeares of *Puberty*, is more obscure. It seemeth to be, for that when much of the *Moysture* of the *Body*, which did before irrigate the *Parts*, is drawne down to the *Spermatieall* vessels; it leaveth the *Body* more hot than it was; whence commeth the *Dilatation* of the *Pipes*: For we see plainly, all Effects of Heat, doe then come on; As *Pilosities*, more *Roughnesse* of the *Skinne*, *Hardnesse* of the *Flesh*, &c.

The Industry of the *Musitian*, hath produced two other Meanes of *Straining*, or *Intension* of *Strings*, besides their *Winding up*. The one is the *Stopping* of

175

176

177

Experiments  
in Consort  
touching the  
more Treble,  
and the more  
Base Tones, or  
Musieall  
Sounds.

178

179

180

181



of the *String* with the *Finger* ; As in the Necks of Lutes, Viols, &c. The other is the *Shortnesse* of the *String* ; As in Harps, Virginalls, &c. Both these have one, and the same reason ; For they cause the *String* to give a quicker Start.

182 In the *Straining* of a *String*, the further it is strained, the lesse *Superstraining* goeth to a *Note* ; For it requireth good Winding of a *String*, before it will make any *Note* at all : And in the Stops of Lutes, &c. the higher they goe, the lesse Distance is betweene the Frets.

183 If you fill a *Drinking Glasse* with *Water*, (especially one Sharp below, and Wide above,) and fillip upon the Brim, or Out-side ; And after empty Part of the *Water*, and so more and more, and still trie the *Tone* by Fillipping ; you shall finde the *Tone* fall, and be more *Base*, as the *Glasse* is more Empty.

Experiments  
in Confort  
touching the  
Proportion of  
Treble and Base  
Tones.

The Just and Measured Proportion of the *Aire Percussed*, towards the *Basenesse* or *Treblenesse* of *Tones*, is one of the greatest Secrets in the Contemplation of Sounds. For it discovereth the true Coincidence of *Tones* into *Diapasons* ; Which is the Returne of the same *Sound*. And so of the *Concords* and *Discords*, between the *Vnison*, and *Diapason* ; Which we have touched before, in the *Experiments* of *Musicke* ; but thinke fit to resume it here, as a principall Part of our Enquiry touching the *Nature* of *Sounds*. It may bee found out in the *Proportion* of the *Winding* of *Strings* ; In the *Proportion* of the *Distance* of *Frets* ; And in the *Proportion* of the *Concave* of *Pipes*, &c. But most commodiously in the last of these.

184 Trie therefore the *winding* of a *String* once about, as soon as it is brought to that Extension, as will give a *Tone* ; And then of twice about ; And thrice about, &c. And mark the Scale or Difference of the Rise of the *Tone* : Whereby you shall discover, in one, two Effects ; Both the *Proportion* of the *Sound* towards the *Dimension* of the *winding* ; And the *Proportion* likewise of the *Sound* towards the *String*, as it is more or lesse strained. But note that to measure this, the way will be, to take the Length in a right Line of the *String*, upon any Winding about of the Pegge.

185 As for the *Stops*, you are to take the *Number* of *Frets* ; And principally the *Length* of the *Line*, from the first Stop of the *String*, unto such a Stop as shall produce a *Diapason* to the former Stop, upon the same *String*.

186 But it will best (as it is said) appeare, in the *Bores* of *Wind-Instruments* : And therefore cause some halfe dozen *Pipes*, to bee made, in length, and all things else, alike, with a single, double, and so on to a sextuple *Bore* ; And so marke what Fall of *Tone* every one giveth. But still in these three last *Instances*, you must diligently observe, what *length* of *String*, or *Distance* of *Stop*, or *Concave* of *Aire*, maketh what *Rise* of *Sound*. As in the last of these (which (as we said) is that, which giveth the aptest demonstration,) you must set downe what Encrease of *Concave* goeth to the making of a *Note* higher ; And what of two *Notes* ; And what of three *Notes* ; And so up to the *Diapason* : For then the great Secret of *Numbers* and *Proportions*, will appeare. It is not unlike, that those that make *Recorders*, &c. know this already : for that they make them in *Seis*. And likewise *Bell-founders* in fitting the



the tune of their *Bells*. So that Enquiry may save Triall. Surely, it hath been observed by one of the *Ancients*, that an *Empty Barrell* knocked upon with the finger, giveth a *Diapason* to the *Sound* of the like *Barrell* full; But how that should be, I doe not well understand; For that the knocking of a *Barrell*, full or *Emptie*, doth scarce give any *Tone*.

There is required some sensible Difference in the *Proportion* of creating a *Note*, towards the *Sound* it selfe, which is the *Passive*: And that it bee not too neare, but at a distance. For in a *Recorder*, the three uppermost Holes, yeeld one *Tone*; which is a *Note* lower than the *Tone* of the first three. And the like (no doubt) is required in the *Winding* or *Stopping* of *Strings*.

There is another Difference of *Sounds*, which wee will call *Exterieur*, and *Interiour*. It is not *Soft*, nor *Loud*: Nor it is not *Base*, nor *Treble*: Nor it is not *Musicall*, nor *Immusicall*: Though it bee true, that there can bee no *Tone* in an *Interiour Sound*: But on the other side, in an *Exterieur Sound*, there may bee both *Musicall* and *Immusicall*. Wee shall therefore enumerate them, rather than precisely distinguish them; Though (to make some Adumbration of that wee meane) the *Interiour* is rather an *Impulsion* or *Contusion* of the *Aire*, than an *Elision* or *Section* of the same. So as the *Percussion* of the one, towards the other, differeth, as a *Blow* differeth from a *Cut*.

In *Speech* of *Man*, the *Whispering*, (which they call *Susurrus* in *Latine*), whether it be louder or softer, is an *Interiour Sound*; But the *Speaking out*, is an *Exterieur Sound*; And therefore you can never make a *Tone*, nor sing in *whispering*; But in *Speech* you may: So *Breathing*, or *Blowing* by the *Mouth*, *Bellows*, or *Wind*, (though lowd) is an *Interiour Sound*; But the *Blowing* thow a *Pipe*, or *Concave*, (though soft) is an *Exterieur*. So likewise the greatest *Winds*, if they have no *Coarctation*, or blow not hollow, give an *Interiour Sound*; The *Whistling* or hollow *wind* yeeldeth a *Singing*, or *Exterieur Sound*; The former being pent by some other *Body*; The later being pent in by his own *Densitie*: And therefore we see, that when the *wind* bloweth hollow, it is a *Signe* of *Raine*. The *Flame*, as it moveth within it selfe, or is blowne by a *Bellows*, giveth a *Murmur* or *Interiour Sound*.

There is no *Hard Body*, but strucke against another *Hard Body*, will yeeld an *Exterieur Sound*, greater or lesser: In so much as if the *Percussion* be over-soft, it may induce a *Nullity* of *Sound*; But never an *Interiour Sound*; As when one treadeth so softly, that hee is not heard.

Where the *Aire* is the *Percuient*, pent, or not pent, against a *Hard Body*, it never giveth an *Exterieur Sound*; As if you blow strongly with a *Bellows* against a *Wall*.

*Sounds* (both *Exterieur* and *Interiour*), may be made, as well by *Suction*, as by *Emission* of the *Breath*: As in *whistling*, or *Breathing*.

187

Experiments  
in Consort  
touching Ex-  
terieur, and In-  
terieur Sounds

188

189

190

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Experiments  
in Confort  
touching Arti-  
culation of  
Sounds.

192

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199

IT is evident, and it is one of the strangest Secrets in *Sounds*, that the *whole Sound* is not in the *whole Aire* onely; But the *whole Sound* is also in every small *Part* of the *Aire*. So that all the curious Diversitie of *Articulate Sounds*, of the *Voyce* of Man, or Birds, will enter at a small Cranny, Inconfused.

The *Vnequall Agitation* of the *winds*, and the like, though they be materiall to the Carriage of the *Sounds*, further or lesse way; yet they doe not confound the *Articulation* of them at all, within that distance that they can be heard; Though it may be, they make them to be heard lesse Way, than in a Still; as hath beene partly touched.

Over-great Distance confoundeth the *Articulation* of *Sounds*; As we see, that you may heare the *Sound* of a Preachers voyce, or the like, when you cannot distinguish what he saith. And one *Articulate Sound* will confound another; as when many speake at once.

In the *Experiment* Of *Speaking under Water*, when the *Voyce* is reduced to such an Extreme Exilitie, yet the *Articulate Sounds*, (which are the *Words*) are not confounded; as hath beene said.

I conceive, that an *Extreme Small*, or an *Extreme Great Sound*, cannot bee *Articulate*; But that the *Articulation* requireth a *Mediocrity* of *Sound*: For that the *Extreme Small Sound* confoundeth the *Articulation* by *Contracting*; And the *Great Sound*, by *Dispersing*: And although (as was formerly said) a *Sound Articulate*, already created, will be contracted into a small Cranny; yet the first *Articulation* requireth more Dimension.

It hath beene observed, that in a *Roome*, or in a *Chappell*, Vaulted below, and Vaulted likewise in the Roofe, a Preacher cannot be heard so well, as in the like Places not so Vaulted. The Cause is, for that the *Subsequent Words* come on, before the *Precedent Words* vanish: And therefore the *Articulate Sounds* are more confused, though the Groesse of the *Sound* be greater.

The *Motions* of the *Tongue*, *Lips*, *Throat*, *Pallat*, &c. which goe to the *Making* of the severall *Alphabetical Letters*, are worthy Enquiry, and pertinent to the present *Inquisition* of *Sounds*: But because they are subtill, and long to describe, we will referre them over, and place them amongst the *Experiments* of *Speech*. The *Hebrewes* have beene diligent in it, and have assigned, which *Letters* are *Labiall*, which *Dental*, which *Gutturall*, &c. As for the *Latines*, and *Grecians*, they have distinguished betweene *Semi-vowels*, and *Mutes*; And in *Mutes*, betweene *Mutes Tenues*, *Mediae*, and *Aspiratae*; Not amisse; But yet not diligently enough. For the speciall *Stroakes*, and *Motions*, that create those *Sounds*, they have little enquired: As that the *Letters*, *B. P. F. M.* are not expressed, but with the *Contracting*, or *Shutting* of the *Mouth*; That the *Letters*, *N.* and *B.* cannot bee pronounced, but that the *Letter*, *N.* will turne into *M.* As *Hecatonba*, will bee *Hecatomba*. That *M.* and *T.* cannot bee pronounced together; but *P.* will come betweene; as *Emtus*, is pronounced *Emptus*; And a Number of the like. So that if you enquire to the full; you will finde, that to the *Making* of the whole *Alphabet*, there will be fewer *Simple Motions* required, than there are *Letters*.

The *Lungs* are the most Spongy Part of the Body; And therefore ablest to contract, and dilate it selfe; And where it contracteth it selfe, it expelleth the *Aire*; which thorow the *Artire*, *Throat*, and *Mouth*, maketh the *Voyce*: But yet *Articulation* is not made, but with the



the helpe of the *Tongue*, *Pallate*, and the rest of those they call *Instruments of voyce*.

There is found a Similitude, betweene the *Sound* that is made by *Inanimate Bodies*, or by *Animate Bodies*, that have no *Voyce Articulate*; and divers *Letters of Articulate Voyces*: And commonly Men have given such Names to those *Sounds*, as doe allude unto the *Articulate Letters*. As *Trembling of Water* hath Resemblance with the *Letter L*; *Quenching of Hot Metalls*, with the *Letter Z*; *Snarling of Dogs*, with the *Letter R*; The *Noise of Scritch-Owles*; with the *Letter Sh*; *Voyce of Cats*, with the *Dypthong Eu*; *Voyce of Cuckoes*, with the *Dypthong Ou*; *Sounds of Strings*, with the *Letter Ng*: So that if a Man, (for Curiosity, or Strangenesse sake,) would make a *Puppet* or other *Dead Body*, to pronounce a *Word*; Let him consider, on the one Part, the Motion of the *Instruments of Voyce*; and on the other part the like *Sounds* made in *Inanimate Bodies*; And what Conformitie there is that causeth the Similitude of *Sounds*; And by that he may minister light to that Effect.

200

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200

the help of the tongue, palate, and the rest of those they call letters  
There is found a similitude, between the sound that is made by  
inanimate bodies, or by inanimate bodies, that have no voice, and  
and divers kinds of articulate voices: And commonly men have given  
such Names to those sounds, as doe allude unto the Articulate Letters.  
As Trembling of Water hath Resemblance with the Letter A, Gurgling of  
for Metals, with the Letter S, Sizzling of Fire, with the Letter R, The  
Voile of swift Gales, with the Letter V, Voice of Cars, with the Letter  
Shout of Men, with the Letter O, Sighing of Men, with the Letter U,  
with the Letter N, So that if a Man, (for Curiosity or Strangeness  
of the sound) would make a word or other Dead Body, to  
pronounce any word, hee must consider, on the one Part,  
the Motion of the Instrument of Voice, and on  
the other part the like sound made in nature.  
And what Consonants  
there is that can be the Similitude  
of the sound, And by that  
he may minister light to  
that Effect.

IN





# NATVRALL HISTORIE.

## III. Century.



ALL *Sounds* (whatsoever) move Round; That is to say; On all *Sides*; *Vpwards*; *Downwards*; *Forwards*; and *Backwards*. This appeareth in all *Instances*.

*Sounds* doe not require to be conveyed to the *Sense*, in a *Right Line*, as *Visibles* doe, but may bee *Arched*; Though it be true, they move strongest in a *Right Line*; Which nevertheless is not caused by the *Rightnesse* of the *Line*, but by the *Shortnesse* of the distance; *Linea recta brevissima*. And therefore we see, if a *wall* be betweene, and you speake on the one *Side*, you heare it on the other, Which is not because the *Sound* Passeth thorow the *wall*; but *Archeth* over the *wall*.

If the *Sound* be *Stopped* and *Repercussed*, it cometh about on the other *Side*, in an *Oblique Line*. So, if in a *Coach*, one side of the *Boot* bee downe, and the other up; And a *Begger* beg on the *Close Side*; you would thinke that he were on the *Open Side*. So likewise, if a *Bell* or *Clock*, bee (for Example) on the *North side* of a *Chamber*; And the *Window* of that *Chamber* be upon the *South*; Hee that is in the *Chamber* will thinke the *Sound* came from the *South*.

*Sounds*, though they spread round, (so that there is an *Orbe*, or *Sphericall Area* of the *Sound*;) yet they move strongest, and goe furthest in the *Fore-Lines*, from the first *Locall Impulsion* of the *Aire*. And therefore in *Preaching*, you shall heare the *Preachers* *Voyce*, better, before the *Pulpit*, than behind it, or on the *Sides*, though it stand open. So a *Harquebuz*, or *Ordinance*, will bee further heard, forwards, from the *Mouth* of the *Peece*, than backwards, or on the *Sides*.

It may be doubted, that *sounds* doe move better *Downwards*, than *Upwards*. *Pulpits* are placed high above the *People*. And when the *Ancient Generalls* spake to their *Armies*, they had ever a *Mount* of *Turfe* cast up, whereupon they stood: But this may be imputed to the *Stops* and *Obstacles*, which the *voice* meeteth with, when one speaketh upon the *levell*. But

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there

201  
Experiments  
in Consort,  
touching the  
Motions of  
Sounds, in  
what Lines  
they are  
Circular, Ob-  
lique, Straigh-  
t; Vpwards,  
downwards;  
Forwards,  
Backwards.

202

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there seemeth to be more in it : For it may be, that *Spirituall Spices*, both of *Things Visible* and *Sounds*, doe move better *Downwards* than *Upwards*. It is a strange Thing, that to Men standing below on the Ground, those that be on the Top of Paules, seem much lesse than they are, and cannot be knowne; But to Men above, those below seeme nothing so much lessened, and may be knowne : yet it is true, that all things to them above, seeme also somewhat contracted, and better collected into Figure : as *Knots* in *Gardens* shew best from an Upper window, or Tarras.

206

But to make an exact Triall of it, let a Man stand in a *Chamber*, not much above the Ground, and speake out at the window, thorow a *Trunke*, to one standing on the Ground, as softly as he can, the other laying his Eare close to the *Trunke* : Then *via versa*, let the other speake below keeping the same Proportion of Softnesse ; And let him in the *Chamber* lay his Eare to the *Trunke* : And this may be the aptest Meanes, to make a Judgement, whether *Sounds* descend, or ascend, better.

Experiments  
in Consort,  
touching the  
Lasting and  
Perishing of  
Sounds ; And  
touching the  
Time they re-  
quire to their  
Generation, or  
Dilation.

207

After that *Sound* is created, (which is in a moment,) wee finde it continueth some small time, melting by little and little. In this there is a wonderfull Errour amongst Men, who take this to bee a *Continuance* of the First *Sound* ; whereas (in truth) it is a *Renovation*, and not a *Continuance* : For the *Body percussed*, hath by reason of the *Percussion*, a *Trepidation* wrought in the *Minute Parts*, and so reneweth the *Percussion* of the *Aire*. This appeareth manifestly, because that the Melting *Sound* of a Bell, or of a String stricken, which is thought to be a *Continuance*, ceaseth as soone as the Bell or String are touched. As in a Virginall, as soone as ever the Jacke fallerth, and toucheth the String, the *Sound* ceaseth ; And in a Bell, after you have chimed upon it, if you touch the Bell, the *Sound* ceaseth. And in this you must distinguish that there are two *Trepidations* : The one Manifest, and Locall ; As of the Bell, when it is Penfile : The other Secret, of the Minute Parts, such as is described in the ninth Instance. But it is true, that the *Locall* helpeth the *Secret* greatly. Wee see likewise that in Pipes, and other winde Instruments, the *Sound* lasteth no longer, than the breath bloweth. It is true, that in Organs, there is a confused Murmur for a while, after you have plaid ; But that is but while the Bellows are in Falling.

208

It is certaine, that in the Noise of great Ordnance, where many are shot off together, the *Sound* will bee carried, (at the least) twenty Miles upon the land, and much further upon the Water. But then it will come to the Eare ; Not in the Instant of the Shooting off, but it will come an Houre, or more later. This must needs be a *Continuance* of the First *Sound* ; For there is no *Trepidation* which should renew it. And the Touching of the Ordnance would not extinguish the *Sound* the sooner : So that in great *Sounds* the *Continuance* is more then Momentany.

209

To try exactly the time wherein *Sound* is *Delated*, Let a Man stand in a Steeple, and have with him a Taper ; And let some vaile be put before the Taper ; And let another Man stand in the Field a Mile off. Then let him in the Steeple strike the Bell ; And in the same instant withdraw the Vaile ; And so let him in the Field tell by his Pulse what distance of Time there is betweene the *Light* seene, and the *Sound* heard : For it is certaine that the *Dilation* of *Light* is in an Instant. This may be tried in farre greater Distances, allowing greater *Lights* and *Sounds*.

210

It is generally knowne and observed, that *Light*, and the *Object* of *Sight*, move swifter than *Sound* ; For we see the *Flash* of a Peece is seene sooner, than



than the *Noise* is heard. And in Hewing Wood, if one be some distance off, he shall see the Arme lifted up for a second Stroke, before he heare the *Noise* of the first. And the greater the Distance, the greater is the Prevention: As we see in Thunder, which is farre off; where the Lightning precedeth the Craek a good space.

*Colours*, when they represent themselves to the Eye, fade not, nor melt not by Degrees, but appeare still in the same Strength; But *Sounds* melt, and vanish, by little and little. The Cause is, for that *Colours* participate nothing with the Motion of the *Aire*; but *Sounds* doe. And it is a plaine Argument, that *Sound* participateth of some Locall Motion, of the *Aire*, (as a Cause *sine quâ non*;) in that, it perisheth so suddenly; For in every Section, or Impulsion of the *Aire*, the *Aire* doth suddenly restore and reunite it self; which the *water* also doth, but nothing so swiftly.

In the Trials of the *Passage*, or *Not Passage* of *Sounds*, you must take heed, you mistake not the *Passing By the sides* of a Body, for the *Passing thorow* a Body: and therefore you must make the *Intercepting* Body very close; For *Sound* will passe thorow a small Chinck.

Where *Sound* passeth thorow a *Hard*, or *Close Body* (as thorow *water*; thorow a *wall*; thorow *Metall*, as in Hawkes Bels stopped, &c.) the *Hard*, or *Close Body*, must be but thinne and small; For else it deadeth and extinguisheth the *Sound* utterly. And therefore, in the Experiment of *Speaking in Aire under water*, the voice must not be very deepe within the *water*: For then the *Sound* pierceth not. So if you speak on the further side of a *Close wall*, if the *wall* be very thick, you shall not be heard: And if there were an Hogshead empty, whereof the Sides were some two Foot thick, and the Bunghole stopped; I conceive the Resounding *Sound*, by the *Communication* of the *Outward Aire*, with the *Aire within*, would be little or none: But only you shall heare the *Noise* of the *Outward Knock*, as if the Vessell were full.

It is certaine, that in the *Passage* of *Sounds* thorow *Hard Bodies*, the Spirit or *Pneumaticall* Part of the *Hard body* it selfe, doth cooperate; But much better, when the Sides of that *Hard Body* are struck, than when the Percussion is only within, without Touch of the Sides. Take therefore a Hawkes Bell, the holes stopped up, and hang it by a threed, within a Bottle Glasse; And stop the Mouth of the Glasse, very close with Wax; and then shake the Glasse, and see whether the Bell give any *Sound* at all, or how weak? But note, that you must instead of the Threed, take a Wire; or else let the Glasse have a great Belly; lest when you shake the Bell, it dash upon the Sides of the Glasse.

It is plaine, that a very *Long*, and *Downe-right Arch*, for the *Sound* to passe, will extinguish the *Sound* quite; So that that *Sound*, which would be heard over a Wall, will not be heard over a Church; Nor that *Sound*, which will be heard, if you stand some distance from the Wall, will be heard if you stand close under the Wall.

*Soft* and *Foraminous Bodies*, in the first Creation of the *Sound*, will dead it; For the striking against Cloth, or Furre, will make little *Sound*; As hath beene said: But in the *Passage* of the *Sound*, they will admit it better than *Harder Bodies*; As we see, that Curtaines, and Hangings, will not stay the *Sound* much; But Glasse-windowes, if they be very Close, will check a

Experiments  
in Confort  
touching the  
Passage and In-  
terceptions of  
SOUNDS.

211

212

213

214

215



216

*Sound* more, than the like *Thicknesse* of *Cloth*. We see also, in the *Rumbling* of the *Belly*, how easily the *Sound* passeth thorow the *Guts*, and *Skin*.

It is worthy the Enquiry, whether *Great Sounds*, (*As* of *Ordnance*, or *Bels*) become not more *Weak* and *Exile*, when they passe thorow *Small Crannies*. For the *Subtilties* of *Articulate Sounds*, (it may be) may passe thorow *Small Crannies*, not confused; But the *Magnitude* of the *Sound* (perhaps,) not so well.

Experiments  
in Confort,  
touching the  
Medium of  
Sounds.

217

218

**T**He *Mediums* of *Sounds* are *Aire*; *Soft* and *Porous Bodies*; Also *Water*. And *Hard Bodies* refuse not altogether to be *Mediums* of *Sounds*. But all of them are dull and unapt *Deferents*, except the *Aire*.

In *Aire*, the *Thinner* or *Drier Aire*, carrieth not the *Sound* so well, as the more *Dense*; As appeareth in *Night Sounds*; And *Evening Sounds*; And *Sounds* in moist *Weather*, and *Southerne Winds*. The reason is already mentioned in the *Title* of *Majoration of Sounds*; Being for that *Thin Aire* is better pierced; but *Thick Aire* preserveth the *Sound* better from *Waste*; Let further *Triall* be made by *Hollowing* in *Mists*, and *Gentle Showers*: For (it may be) that will somewhat dead the *Sound*.

219

How farre forth *Flame* may be a *Medium* of *Sounds*, (especially of such *Sounds* as are created by *Aire*, and not betwixt *Hard Bodies*) let it be tried, in *Speaking* where a *Bonfire* is betweene; But then you must allow for some disturbance, the *Noise* that the *Flame* it selfe maketh.

220

Whether any other *Liquours*, being made *Mediums*, cause a diversity of *Sound* from *Water*, it may be tried: As by the *Knapping* of the *Tongs*; Or *Striking* the *Bottome* of a *Vessell*, filled either with *Milk*, or with *Oile*; which though they be more light, yet are they more unequall *Bodies* than *Aire*.

Of the *Natures* of the *Mediums*, we have now spoken; As for the *Disposition* of the said *Mediums*, it doth consist in the *Penning*, or not *Penning* of the *Aire*; Of which we have spoken before, in the *Title* of *Delation of Sounds*: It consisteth also in the *Figure* of the *Concave*, through which it passeth; Of which we will speak next.

Experiments  
in Confort  
what the Fi-  
gures of the  
Pipes, or Con-  
caves, or the  
Bodies, Deferent  
conduce to the  
Sounds.

221

How the *Figures* of *Pipes*, or *Concaves*, through which *Sounds* passe; Or of other *Bodies* deferent; conduce to the variety and *Alteration* of the *Sounds*; Either in respect of the *Greater Quantity*, or *lesse Quantity* of *Aire*, which the *Concaves* receive; Or in respect of the *Carrying* of *Sounds* longer or shorter way; Or in respect of many other *Circumstances*; they have beene touched, as falling into other *Titles*. But those *Figures*, which we now are to speak of, we intend to be, as they concerne the *Lines*, through which *Sound* passeth; As *Straight*; *Crooked*; *Angular*; *Circular*; &c.

The *Figure* of a *Bell* partaketh of the *Pyramis*, but yet comming off, and dilating more suddenly. The *Figure* of a *Hunters Horne*, and *Cornet*, is oblique; yet they have likewise *Straight Hornes*, which if they be of the same *Bore* with the *Oblique*, differ little in *Sound*; save that the *Straight* require somewhat a stronger *Blast*. The *Figures* of *Recorders*, and *Flutes*, and *Pipes* are straight; But the *Recorder* hath a lesse *Bore*, and a greater; Above, and below. The *Trumpet* hath the *Figure* of the *Letter S*: which maketh that

Purling



Purling Sound, &c. Generally, the *Straight Line* hath the clearest and roundest Sound, And the *Cröoked* the more Hoarse, and Jarring.

Of a *Sinuöus pipe*, that may have some foure Flexions, Triall would be made. Likewise of a *Pipe*, made like a *Crosse*, open in the midst. And so likewise of an *Angular Pipe*: And see what will be the Effects of these severall Sounds. And so againe of a *Circular Pipe*; As if you take a *Pipe* perfect Round, and make a Hole whereinto you shall blow; And another Hole not farre from that; But with a *Traverse* or *Stop* between them; So that your Breath may goe the Round of the *Circle*, and come forth at the second Hole. You may trie likewise *Percussions* of *Solid Bodies* of severall *Figures*; As *Globes*, *Flats*, *Cubes*, *Crosses*, *Triangles*, &c. And their *Combinations*; As *Flat* against *Flat*; And *Convex* against *Convex*; And *Convex* against *Flat*, &c. And mark well the diversities of the Sounds. Trie also the difference in Sound of severall *Crafsitudes* of *Hard Bodies* percussed; And take knowledge of the diversities of the Sounds. I my selfe have tried, that a *Bell* of *Gold* yeeldeth an excellent Sound, not inferiour to that of *Silver*, or *Brasse*, but rather better: yet we see that a piece of *Money* of *Gold* foundeth farre more flat than a peece of *Money* of *Silver*.

The *Harpe* hath the *Concave*, not along the *Strings*, but across the *Strings*; And no *Instrument* hath the Sound so Melting, and Prolonged, as the *Irish Harpe*. So as I suppose, that if a *Virginal* were made with a double *Concave*; the one all the length as the *Virginal* hath; the other at the End of the *Strings*, as the *Harpe* hath; It must needs make the Sound perfecter, and not so Shallow, and Jarring. You may trie it, without any Sound-Board along, but onely Harp-wise, at one End of the *Strings*: Or lastly with a double *Concave*, at Each end of the *Strings* one.

There is an apparent Diverfitie between the *Species Visible*, and *Audible*, in this; That the *Visible* doth not mingle in the *Medium*, but the *Audible* doth. For if we looke abroad, we see Heaven, a number of Starres, Trees, Hills, Men, Beasts, at once. And the *Species* of the one doth not confound the other. But if so many Sounds come from severall Parts, one of them would utterly confound the other. So we see, that *Voyces* or *Consorts* of *Musick* doe make an Harmony by *Mixture*, which *Colours* doe not. It is true nevertheless, that a great *Light* drowneth a smaller, that it cannot be seene; As the *sunne* that of a *Gloworme*; as well as a Great Sound drowneth a lesser. And I suppose likewise, that if there were two *Lanthornes* of *Glasse*, the one a *Crimlin*, and the other an *Azure*, and a *Candle* within either of them, those Coloured Lights would mingle and cast upon a *White Paper* a *Purple Colour*. And even in *Colours*, they yeeld a faint and weak *Mixture*: For white walls make *Roomes* more lightsome than black, &c. But the Cause of the *Confusion* in Sounds, and the *Inconfusion* in *Species Visible*, is, For that the *Sight* worketh in *Right Lines*, and maketh severall *Cones*; And so there can be no *Coincidence* in the *Eye*, or *Visuall Point*: But *Sounds*, that move in *Oblique* and *Arcuate Lines*, must needs encounter, and disturbe the one the other.

The sweetest and best *Harmony* is, when every *Part*, or *Instrument*, is not heard by it selfe, but a *Conflation* of them all; Which requireth to stand some distance off. Even as it is in the *Mixture* of *Perfumes*; Or the *Taking* of the *Smels* of severall *Flowers* in the *Aire*.

The *Disposition* of the *Aire*, in other *Qualities*, except it be joynd with *Sound*, hath no great Operation upon *Sounds*: For whether the *Aire* bee

222

223

Experiments  
in Consort,  
touching the  
Mixture of  
Sounds.

224

225

226



lightsome or darke, hot or cold, quiet or stirring, (except it be with *Noise*) sweet-smelling, or stinking, or the like; it importeth not much: Some petty Alteration or difference it may make.

227

But *Sounds* doe disturbe and alter the one the other: Sometimes the one drowning the other, and making it not heard; Sometimes the one jarring and discording with the other, and making a Confusion; Sometimes the one Mingling and Compounding with the other, and making an Harmony.

228

Two *Voices* of like *lowdnesse*, will not be heard, twice as farre, as one of them alone; And two *Candles* of like light, will not make Things seeme twice as farre off, as one. The Cause is profound; But it seemeth that the *Impressions* from the *Objects* of the *Senses*, doe mingle respectively, every one with his kinde; But not in proportion, as is before demonstrated: And the reason may be, because the first *Impression*, which is from *Privative* to *Active*, (As from *Silence* to *Noise*, or from *Darknesse* to *Light*,) is a greater Degree, than from *Lesse Noise*, to *More Noise*, or from *Lesse Light* to *More Light*. And the Reason of that againe may be; For that the *Aire*, after it hath received a Charge, doth not receive a Surcharge, or greater Charge, with like Appetite, as it doth the first Charge. As for the Encrease of Vertue, generally, what Proportion it beareth to the Encrease of the Matter, it is a large Field, and to be handled by it selfe.

Experiments  
in Consort  
touching Me-  
lioration of  
Sounds.

229

ALL *Reflexions* Concurrent doe make *Sounds* Greater; But if the Body that createth, either, the Originall *Sound*, or the *Reflexion*, be clean and smooth, it maketh them Sweeter. Triall may be made of a *Lute*, or *Violl*, with the Belly of polished *Brasse*, in stead of *Wood*. We see that even in the Open *Aire*, the *Wire String* is sweeter, than the *String* of *Guts*. And we see that for *Reflexion*, *water* excelleth; As in *Musick* near the *water*; Or in *Eccho's*.

230

It hath been tryed, that a *Pipe* a little moistned on the inside, but yet so as there be no Drops left, maketh a more solemne *Sound*, than if the *Pipe* were dry: But yet with a sweet Degree of *Sibillation*, or *Purling*; As we touched it before in the title of *Equality*. The Cause is, for that all Things Porous, being superficially wet, and (as it were) between drie and wet, become a little more Even and Smooth; But the *Purling*, (which must needs proceed of *Inequality*,) I take to be bred between the Smoothnesse of the inward Surface of the *Pipe*, which is wet; And the Rest of the *Wood* of the *Pipe*, unto which the *Wet* commeth not, but it remaineth drie.

231

In *Frosty Weather*, *Musick* within doors soundeth better. Which may be, by reason, not of the Disposition of the *Aire*, but of the *Wood* or *String* of the *Instrument*, which is made more Crispe, and so more porous and hollow: And we see that *Old Lutes* sound better than *New*, for the same reason. And so doe *Lute-strings* that have been kept long.

232

*Sound* is likewise *Meliorated* by the Mingling of *Open Aire* with *Pent Aire*; Therefore Triall may be made, of a *Lute* or *Violl* with a double Belly; Making another Belly with a Knot over the Strings; yet so, as there bee Room enough for the Strings, and Room enough to play below that Belly. Triall may be made also of an *Irish Harpe*, with a Concave on both Sides; whereas it useth to have it but on one Side. The doubt may be, lest it should make too much Resounding; whereby one Note would overtake another.

233

If you sing in the Hole of a *Drum*, it maketh the *Singing* more sweet. And so I conceive it would, if it were a *Song* in Parts, sung into severall *Drums*; And for handsonnesse and strangeness sake, it would not be amisse to have a Curtain between the Place, where the *Drums* are, and the *Hearers*.

When



When a *Sound* is created in a *Wind-Instrument*, between the *Breath* and the *Aire*, yet if the *Sound* be communicate with a more equall Body of the *Pipe*, it *meliorate* the *Sound*. For (no doubt) there would be a differing *Sound* in a *Trumpet*, or *Pipe of Wood*; And again in a *Trumpet* or *Pipe of Brasse*. It were good to trie *Recorders* & *Hunters Hornes of Brasse*, what the *Sound* would be.

*Sounds* are *meliorated* by the *Intension* of the *Sense*, where the *Common Sense* is collected most, to the particular *Sense of Hearing*, and the *Sight* suspended: And therefore, *Sounds* are sweeter, (as well as greater,) in the *Night*, than in the *Day*; And I suppose, they are sweeter to blinde Men, than to Others: And it is manifest, that betweene *Sleeping* and *Waking*, (when all the *Senses* are bound and suspended) *Musick* is farre sweeter, than when one is fully *waking*.

IT is a Thing strange in Nature, when it is attentively considered; How *Children*, and some *Birds*, learne to *imitate Speech*. They take no Marke (at all) of the *Motion* of the *Mouth* of Him that speaketh; For *Birds* are as well taught in the *Darke*, as by *Light*. The *Sounds of Speech* are very Curious and Exquisite: So one would thinke it were a Lesson hard to learne. It is true, that it is done with time, and by little and little, and with many *Essayes* and *Proffers*: But all this dischargeth not the Wonder. It would make a Man think (though this which we shall say may seeme exceeding strange) that there is some *Transmission* of *Spirits*; and that the *Spirits* of the *Teacher* put in *Motion*, should worke with the *Spirits* of the *Learner*, a Pre-disposition to offer to *Imitate*; And so to perfect the *Imitation* by degrees. But touching *Operations* by *Transmissions of Spirits*, (which is one of the highest secrets in Nature,) we shall speake in due place; Chiefly when we come to enquire of *Imagination*. But as for *Imitation*, it is certaine, that there is in Men, and other *Creatures*, a pre-disposition to *Imitate*. We see how ready *Apes* and *Monkies* are, to *imitate* all *Motions* of Man: And in the *Catching* of *Dottrells*, we see, how the Foolish *Bird* playeth the *Ape* in *Gestures*: And no Man (in effect) doth accompany with others, but he learneth, (ere he is aware,) some *Gesture*, or *Voice*, or *Fashion* of the other.

In *Imitation of Sounds*, that Man should be the *Teacher*, is no Part of the Matter; For *Birds* will learne one of another; And there is no Reward, by feeding, or the like, given them for the *Imitation*; And besides, you shall have *Parrots*, that will not onely *imitate* *Voices*, but *Laughing*, *Knocking*, *Squeaking* of a *Doore* upon the *Hinges*, or of a *Cart-whee*le; And (in effect) any other *Noise* they heare.

No *Beast* can *imitate* the *Speech* of Man, but *Birds* onely; For the *Ape* it selfe, that is so ready to *imitate* otherwise, attaineth not any degree of *Imitation* of *Speech*. It is true, that I have known a *Dog*, that if one howled in his Eare, he would fall a howling a great while. What should be the Aptnesse of *Birds*, in comparison of *Beasts*, to *imitate* the *Speech* of Man, may be further enquired. Wee see that *Beasts* have those Parts; which they count the *Instruments of Speech*, (as *Lips*, *Teeth*, &c.) liker unto Man, than *Birds*. As for the *Necke*, by which the *Throat* passeth; we see many *Beasts* have it; for the *Length*, as much as *Birds*. What better *Gorge*, or *Attire*, *Birds* have, may be further enquired. The *Birds* that are knowne to be *Speakers*, are, *Parrats*, *Pyes*, *Iayers*, *Dames*, and *Ravens*. Of which *Parrats* have an adunque *Bill*, but the rest not.

But I conceive, that the Aptnesse of *Birds*, is not so much in the *Conformity* of the *Organs of Speech*, as in their *Attention*. For *Speech* must come by *Hearing*,

234

235

Experiments  
in Consort,  
touching the  
Imitation of  
Sounds.

236

237

238

239



*Hearing, and Learning*; And *Birds* give more heed, and marke *Sounds*, more than *Beasts*; Because naturally they are more delighted with them, and practise them more; As appeareth in their *Singing*. We see also, that those that teach *Birds* to sing, doe keep them Waking, to increase their *Attention*. We see also, that *Cock-Birds*, amongst *Singing-Birds*, are ever the better *Singers*; which may be, because they are more lively, and listen more.

240

*Labour, and Intention to imitate Voyces*, doth conduce much to *Imitation*: And therefore we see, that there be certaine *Pantomimi*, that will represent the voyces of *Players of Enterludes*, so to life, as if you see them not, you would think they were those *Players* themselves; And so the *Voyces* of other *Men* that they heare.

241

There have beene some, that could counterfeit the *Distance of Voyces*, (which is a *Secondary Object of Hearing*;) in such sort; As when they stand fast by you, you would think the *Speech* came from a farre off, in a fearfull manner. How this is done, may be further enquired. But I see no great use of it, but for Imposture, in counterfeiting Ghosts or Spirits.

Experiments  
in Confort,  
touching the  
Reflexion of  
Sounds.

There be three Kinde of *Reflexions of Sounds*; A *Reflexion Concurrent*; A *Reflexion Iterant*, which we call *Eccho*; And a *Super-reflexion*, or an *Eccho* of an *Eccho*, whereof the first hath beene handled in the *Title of Magnitude of Sounds*: The Latter two we will now speak of.

242

The *Reflexion of Species Visible*, by *Mirroures*, you may command; Because passing in Right Lines, they may be guided to any point: But the *Reflexion of Sounds* is hard to master; Because the *Sound* filling great Spaces in *Arched Lines*, cannot be so guided: And therefore we see there hath not beene practised, any Meanes to make *Artificiall Eccho's*. And no *Eccho* already knowne returneth in a very narrow Roome.

243

The *Naturall Eccho's* are made upon *walls, woods, Rocks, Hills, and Bankes*; As for *Waters*, being neare, they make a *Concurrent Eccho*; but being further off, (as upon a large *River*) they make an *Iterant Eccho*: For there is no difference between the *Concurrent Eccho*, and the *Iterant*, but the *Quicknesse*, or *Slownesse* of the Returne. But there is no doubt, but *water* doth helpe the *Delation of Eccho*; as well as it helpeth the *Delation of Originall Sounds*.

244

It is certaine, (as hath beene formerly touched,) that if you speake thorow a *Trunke*, stopped at the further end, you shall finde a Blast returne upon your Mouth, but no *Sound* at all. The Cause is, for that the *Clofenesse*, which preserveth the *Originall*, is not able to preserve the *Reflected Sound*: Besides that *Eccho's* are seldome created, but by loud *Sounds*. And therefore there is lesse hope of *Artificiall Eccho's* in *Aire*, pent in a narrow *Concave*. Nevertheless it hath bin tried, that One leaning over a *well*, of 25. Fathome deep, and speaking though but softly, (yet not so soft as a whisper,) the *water* returned a good *Audible Eccho*. It would be tried, whether Speaking in *Caves*, where there is no Issue, save where you speak, will not yeeld *Eccho's*, as *wells* doe.

245

The *Eccho* commeth as the *Originall Sound* doth, in a round Orbe of *Aire*: It were good to try the Creating of the *Eccho*, where the *Body Repercussing* maketh an Angle: As against the Returne of a *Wall*, &c. Also we see that in *Mirroures*, there is the like Angle of Incidence, from the Object to the *Glasse*, and from the *Glasse* to the *Eye*. And if you strike a *Ball* side-long, not full upon the *Surface*, the *Rebound* will be as much the contrary way; Whether



ther there be any such *Resilience* in *Eccho's*, (that is, whether a Man shall heare better, if he stand aside the Body *Repercussing*, than if he stand where he speaketh, or any where in a right Line betweene;) may be tried. Triall likewise would be made, by Standing nearer the place of *Repercussing*, than he that speaketh; And againe by Standing further off, than he that speaketh; And so knowledge would be taken, whether *Eccho's*, as well as *Originall Sounds*, be not strongest neare hand.

There be many Places, where you shall heare a number of *Eccho's* one after another: And it is, when there is Variety of *Hills* or *woods*, some nearer, some further off: So that the Returne from the further, being last created, will be likewise last heard.

As the *Voice* goeth round, as well towards the Back, as towards the Front of him that speaketh; So likewise doth the *Eccho*; For you have many Back-*Eccho's* to the Place where you stand.

To make an *Eccho*, that will report, three, or foure, or five Words, distinctly, it is requisite, that the *Body Repercussing*, be a good distance off: For if it be neare, and yet not so neare, as to make a *Concurrent Eccho*, it choppeth with you upon the sudden. It is requisite likewise, that the *Aire* bee not much *pent*. For *Aire*, at a great distance, *pent*, worketh the same effect with *Aire*, at large, in a small distance. And therefore in the *Triall of Speaking* in the *well*, though the *well* was deepe, the *Voice* came back, suddenly; And would beare the Report but of two Words.

For *Eccho's* upon *Eccho's*, there is a rare Instance thereof in a Place, which I will now exactly describe. It is some three or foure Miles from *Paris*, neare a Towne called *Pont-Charenton*; And some Bird-bolt shot, or more, from the River of *Seane*. The Roome is a *Chappell*, or small *Church*. The Walls all standing, both at the Sides, and at the Ends. Two Rowes of Pillars, after the manner of Isles of *Churches*, also standing; The Roofe all open, not so much as any Embowment neere any of the walls left. There was against every Pillar, a Stack of Billets, above a Mans Height. which the Watermen, that bring Wood downe the *Seane*, in Stacks, and not in Boats, laid there (as it seemeth) for their ease. Speaking at the one End, I did heare it returne the Voice thirteene severall times; And I have heard of others, that it would returne sixteene times: For I was there about three of the Clock in the afternoone: And it is best, (as all other *Eccho's* are) in the Evening. It is manifest, that it is not *Eccho's* from severall places, but a *Tossing* of the *Voice*, as a Ball, to and fro; Like to *Reflexions* in *Looking-glasses*; where if you place one *Glasse* before, and another behinde, you shall see the *Glasse* behinde with the *Image*, within the *Glasse* before; And againe, the *Glasse* before in that; and divers such *Super-Reflexions*, till the *species speciei* at last die. For it is every Returne weaker, and more shady. In like manner, the *Voice* in that *Chappell*, createth *speciem speciei*, and maketh succeeding *Super-Reflexions*; For it melteth by degrees, and every *Reflexion* is weaker than the former: So that, if you speake three Words, it will (perhaps) some three times report you the whole three Words; And then the two latter Words for some times; And then the last Word alone for sometimes; Still fading, and growing weaker. And whereas in *Eccho's* of one Returne, it is much to heare foure or five Words; In this *Eccho* of so many Returnes, upon the matter, you heare above twenty Words for three.

The like *Eccho* upon *Eccho*, but only with two Reports, hath beene observed to be, if you stand betweene a *House*, and a *Hill*, and lure towards the

246

247

248

249

250

Hill



*Hill.* For the *House* will give a *Back-Eccho*; One taking it from the other, and the latter the weaker.

251

There are certaine *Letters*, that an *Eccho* will hardly expresse; As *S*, for one; Especially being Principall in a Word. I remember well, that when I went to the *Eccho* at *Pont-Charenton*, there was an Old *Parisian*, that took it to be the Work of Spirits, and of good Spirits. For, (said he) call *Satan*, and the *Eccho* will not deliver backe the Devils name; But will say, *Vai en*; Which is as much in *French*, as *Apaze*, or *Avoid*. And thereby I did hap to finde, that an *Eccho* would not returne *S*, being but a Hissing and an *Interiour Sound*.

252

*Eccho's* are some more sudden, and chop againe, as soone as the *Voice* is delivered; As hath beene partly said: Others are more deliberate, that is, give more Space betweene the *Voice*, and the *Eccho*; which is caused by the local Nearnesse, or Distance: Some will report a longer Traine of Words; And some a shorter: Some more loud (full as loud as the *Originall*, and sometimes more loud;) And some weaker and fainter.

253

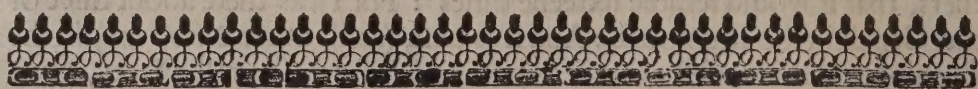
Where *Eccho's* come from severall Parts, at the same distance, they must needs make (as it were) a *Quire* of *Eccho's*, and so make the Report greater, and even a *Continued Eccho*; which you shall find in some *Hills*, that stand encompassed, Theatre-like.

254

It doth not yet appeare, that there is *Refraction* in *Sounds*, as well as in *Species Visible*. For I doe not thinke, that if a *Sound* should passe through divers *Mediums*, (as *Aire*, *Cloth*, *Wood*) it would deliver the *Sound*, in a differing Place, from that unto which it is deferred; which is the Proper Effect of *Refraction*. But *Majoration* which is also the Worke of *Refraction*, appeareth plainly in *Sounds*, (as hath beene handled at full;) But it is not by *Diversitie* of *Mediums*.

Experiments  
in Consort,  
touching the  
Consent and  
Dissent be-  
tween *Visibles*  
and *Audibles*.

Wee haue *obiter*, for Demonstrations sake, used in divers *Instances*, the *Examples* of the *Sight*, and *Things Visible*, to illustrate the *Nature* of *Sounds*. But we thinke good now to prosecute that *Comparison* more fully.



## CONSENT OF VISIBLES and Audibles.

255

**B**oth of them spread themselves in *Round*, and fill a whole *Floare* or *Orbe*, unto certaine Limits: And are carried a great way: And do languish and lessen by degrees, according to the Distance of the objects from the *Sensories*.

256

Both of them have the whole *Species* in every small portion of the *Aire* or *Medium*, So as the *Species* doe passe through small *Cranies*, without *Confusion*: As we see ordinarily in *Levels*, as to the *Eye*; And in *Cranies*, or *Chinks*, as to the *Sound*.

257

Both of them are of a sudden and easie *Generation* and *Delation*; And likewise perish swiftly, and suddenly; As if you remove the *Light*; Or touch the *Bodies* that give the *Sound*.

Both



Both of them doe receive and carry exquisite and accurate Differences; As of Colours, Figures, Motions, Distances, in *Visibles*; And of Articulate Voices, Tones, Songs, and Quaverings, in *Audibles*.

258

Both of them in their Vertue and Working, do not appeare to emit any Corporall Substance into their *Mediums*, or the Orbe of their Vertue; Neither again to rise or stirre any evident locall Motion in their *Mediums*, as they passe; But only to carry certaine Spirituall Species; The perfect knowledge of the Cause whereof, being hitherto scarcely attained, we shall search and handle in due place.

259

Both of them seeme not to generate or produce any other Effect in Nature, but such as appertaineth to their proper Objects, and Senses, and are otherwise Barren.

260

But Both of them in their owne proper Action, doe worke three manifest Effects. The First, in that the Stronger Species drowneth the Lesser; As the Light of the Sun, the light of a Glow-worme; The Report of an Ordnance, the Voice: The Second, in that an Object of Surcharge or Excesse destroyeth the Sense; As the Light of the Sunne the Eye, a violent Sound (neare the Eare) the Hearing: The Third, in that both of them will be reverberate; As in Mirrours; And in Eccho's.

261

Neither of them doth destroy or hinder the Species of the other, although they encounter in the same Medium; As Light or Colour hinder not Sound; Nor *conversimodo*.

262

Both of them affect the Sense in Living Creatures, and yeeld Objects of Pleasure and Dislike: Yet neverthelesse, the Objects of them doe also (if it be well observed) affect and worke upon dead Things; Namely such, as have some Conformity with the Organs of the two Senses; As *Visibles* worke upon a Looking-glasse, which is like the Pupill of the Eye; And *Audibles* upon the Places of Eccho, which resemble, in some sort, the Caverne and structure of the Eare.

263

Both of them do diversly work, as they have their Medium diversly disposed. So a Trembling Medium (as Smoake) maketh the Object seeme to tremble; and a Rising or Falling Medium (as Winds) maketh the Sounds to rise, or fall.

264

To Both, the Medium, which is the most Propitious and Conducibile, is Aire; For Glasse or Water, &c. are not comparable.

265

In Both of them, where the object is Fine and Accurate, it conduceth much to haue the Sense Intensive, and Erect; In so much as you contract your Eye, when you would see sharply; And erect your Eare, when you would heare attentively; which in Beasts that haue Eares moveable, is most manifest.

266

The Beames of Light, when they are multiplied, and conglomerate, generate Heat; which is a different Action, from the Action of Sight: And the Multiplication and Conglomeration of Sounds doth generate an extreme Rarefaction of the Aire; which is an Action materiate, differing from the Action of Sound; If it bee true (which is anciently reported) that Birds, with great shouts, have fallen downe.

267



## DISSENTS OF VISIBLES and Audibles.

268 **T**He *Species* of *Visibles* seeme to be *Emissions* of *Beames* from the *Object* seen; Almost like *Odours*, save that they are more *Incorporeall*: But the *Species* of *Audibles* seeme to Participate more with *Locall Motion*, like *percussions*, or *Impressions* made upon the *Aire*. So that whereas all *Bodies* doe seeme to worke in two manners; Either by the *Communication* of their *Natures*; Or by the *Impressions* and *Signatures* of their *Motions*; The *Diffusion* of *Species Visible* seemeth to participate more of the former *Operation*; and the *Species Audible* of the latter.

269 The *Species* of *Audibles* seeme to be carried more manifestly thorow the *Aire*, than the *Species* of *Visibles*: For (I conceive) that a Contrary strong *Wind* will not much hinder the *Sight* of *Visibles*, as it will doe the *Hearing* of *Sounds*.

270 There is one *Difference*, above all others, betweene *Visibles* and *Audibles*, that is the most remarkable; as that whereupon many smaller *Differences* doe depend: Namely, that *Visibles*, (except *Lights*,) are carried in *Right Lines*; and *Audibles* in *Arcuate Lines*. Hence it commeth to passe, that *Visibles* doe not intermingle, and confound one another, as hath beene said before; But *Sounds* doe. Hence it commeth, that the *Solidity* of *Bodies* doth not much hinder the *Sight*, so that the *Bodies* be cleare, and the *Pores* in a *Right Line*, as in *Glasse*, *Chrystall*, *Diamonds*, *Water*, &c. But a thin *Scarfe*, or *Handkerchiefe*, though they be *Bodies* nothing so solid, hinder the *Sight*: Whereas (contrariwise) these *Porous Bodies* doe not much hinder the *Hearing*, but solid *Bodies* doe almost stop it, or at the least attenuate it. Hence also it commeth, that to the *Reflexion* of *Visibles*, small *Glasses* suffice; but to the *Reverberation* of *Audibles*, are required greater *Spaces*, as hath likewise beene said before.

271 *Visibles* are scene further off, than *Sounds* are heard; Allowing neverthelesse the *Rate* of their *Bignesse*: For otherwise a great *Sound* will be heard further off, than a *Small Body* scene.

272 *Visibles* require (generally) some *Distance* betweene the *Object*, and the *Eye*, to bee better scene; Whereas in *Audibles*, the nearer the *Approch* of the *Sound* is to the *Sense*, the better. But in this there may be a double *Error*. The one because to *Seeing*, there is required *Light*; And any thing that toucheth the *Pupill* of the *Eye* (all over,) excludeth the *Light*. For I have heard of a *Person* very credible, (who himselfe was cured of a *Cataract* in one of his *Eyes*,) that while the *Silver Needle* did worke upon the *Sight* of his *Eye*, to remove the *Filme* of the *Cataract*, he never saw any thing more cleare or perfect, than that white *Needle*: Which (no doubt,) was, because the *Needle* was lesser than the *Pupill* of the *Eye*, and so tooke not the *Light* from it. The other *Error* may be, for that the *Object* of *Sight* doth strike upon the *pupill* of the *Eye*, directly without any interception; whereas the *Cave* of the *Eare* doth hold off the *Sound* a little from the *Organ*: And so neverthelesse there is some *Distance* required in both.

273 *Visibles* are swiftlier carried to the *Sense*, than *Audibles*; As appeareth in *Thunder*



Thunder and Lightning; Flame and Report of a Peece; Motion of the Aire in Hewing of Wood. All which have beene set downe heretofore, but are proper for this Title.

I conceive also, that the *Species* of *Audibles*, doe hang longer in the Aire than those of *Visibles*: For although eventhose of *Visibles*, doe hang some time, as we see in *Rings turned*, that shew like Spheres; In *Lute-strings* fil-lipped; A *Fire-brand* carried along, which leaveth a Traine of Light be-hinde it; and in the *Twilight*; And the like: Yet I conceive that *Sounds* stay longer, because they are carried up and downe with the Winde: And because of the Distance of the Time, in *Ordnance discharged*, and heard twenty Miles off.

In *Visibles*, there are not found Objects so odious and ingrate to the *Sense*, as in *Audibles*. For foule *Sights* doe rather displease, in that they excite the Memory of foule Things, than in the immediate Objects. And therefore in *Pictures*, those foule *Sights* doe not much offend; But in *Audibles*, the Grating of a Saw, when it is sharpned, doth offend so much, as it setteth the Teeth on Edge. And any of the *harsh Discords* in *Musicke*, the Eare doth straight-ways refuse.

In *Visibles*, after great Light, if you come suddenly into the *Darke*; Or contrariwise, out of the *Darke* into a *Glaring light*, The Eye is dazled for a time, and the *Sight* confused; But whether any such Effect be after great *Sounds*, or after a *deepe Silence*, may be better enquired. It is an old Tradition, that those that dwell neare the *Catarraets* of *Nilus*, are stricken deafe: But we finde no such effect, in Cannoniers, nor Millers, nor those that dwell up-on Bridges.

It seemeth that the *Impression* of *Colour* is so weak, as it worketh not but by a Cone of *Direct Beames*, or *Right Lines*; whereof the Basis is in the Ob-ject, and the Verticall Point in the Eye; So as there is a *Corradiation* and *Conjunction* of *Beames*; And those *Beames* so sent forth, yet are not of any force to beget the like borrowed or second *Beames*, except it be by *Reflexion*, whereof we speak not. For the *Beames* passe, and give little *Tincture* to that Aire, which is Adjacent; which if they did, we should see *Colours* out of a *Right line*. But as this is in *Colours*, so otherwise it is in the *Body of Light*. For when there is a *Skreene* between the Candle and the Eye, yet the *Light* passeth to the Paper whereon One writeth; So that the *Light* is seene, where the *Body of the Flame* is not seene; And where any *Colour* (if it were placed where the *Body of the Flame* is) would not be seene. I judge that *Sound* is of this Latter Nature: For when two are placed on both sides of a Wall, and the Voice is heard, I judge it is not onely the *Originall Sound*, which passeth in an *Arched Line*; But the *Sound*, which passeth above the Wall in a *Right Line*, begetteth the like Motion round about it, as the first did, though more weake.

ALL *Concords* and *Discords* of *Musicke*, are (no doubt) *Sympathies* and *Antipathies* of *Sounds*. And so (likewise) in that *Musicke*, which we call *Broken Musicke*, or *Consort Musicke*; Some *Consorts* of *Instruments* are sweeter than others; (A Thing not sufficiently yet observed:) As the *Irish Harpe*, and *Base Viall* agree well: The *Recorder* and *Stringed Musicke* agree well: *Organs* and the *Voice* agree well; &c. But the *Virginalls* and the *Lute*; Or the *Welch-Harpe*, and *Irish-Harpe*; Or the *Voice* and *Pipes* alone, agree not so well; But for the *Melioration* of *Musick*, there is yet much left (in this Point of *Exquisite Consorts*) to trie and enquire.

274

275

276

277

Experiments  
in Consort  
touching the  
Sympathy or  
Antipathy of  
Sounds, one  
with another.

278



279

There is a Common Observation, that if a *Lute*, or *Viall*, be layed upon the Backe, with a small Straw upon one of the *Strings*; And another *Lute* or *Viall* be laid by it; And in the other *Lute*, or *Viall*, the *Vnison* to that *String* be stricken; it will make the *String* move; Which will appeare both to the Eye, and by the *Strawes* Falling off. The like will be, if the *Diapason* or *Eight* to that *String* be stricken, either in the same *Lute*, or *Viall*, or in others lying by; But in none of these there is any Report of *Sound*, that can be discerned, but onely Motion.

280

It was devised, that a *Viall* should have a Lay of Wire Strings below, as close to the Belly as a *Lute*; And then the *Strings* of Guts mounted upon a Bridge, as in Ordinary *Vialls*; To the end, that by this means, the upper *Strings* stricken, should make the lower resound by *Sympathy*, and so make the *Musicke* the better; Which, if it be to purpose, then *Sympathy* worketh, as well by Report of *Sound*, as by *Motion*. But this device I conceive to be of no use, because the upper *Strings*, which are stopped in great variety, cannot maintaine a *Diapason* or *Vnison*, with the Lower, which are never stopped. But if it should be of use at all; it must be in *Instruments* which have no Stops; as *Virginalls*, and *Harpes*; wherein triall may be made of two Rowes of Strings, distant the one from the other.

281

The Experiment of *Sympathy* may be transferred (perhaps) from *Instruments* of *Strings*, to other *Instruments* of *Sound*. As to try if there were in one Steeple, two Bells of *Vnison*, whether the striking of the one would move the other, more then if it were another Accord: And so in *Pipes*, (if they be of equall Bore, and *Sound*;) whether a little Straw or Feather would move in the one *Pipe*, when the other is blowne at an *Vnison*.

282

It seemeth both in *Eare*, and *Eye*, the *Instrument* of *Sense* hath a *Sympathy* or Similitude with that which giveth the *Reflexion*; (As hath beene touched before.) For as the *Sight* of the *Eye* is like a *CrySTALL*, or *Glasse*, or *Water*; So is the *Eare* a sinuous Cave, with a hard Bone, to stop and reverberate the *Sound*: Which is like to the Places that report *Eccho's*.

Experiments  
in Confort  
touching the  
Kindring or  
Helping of the  
Hearing.

283

284

When a Man *Yawneth*; he cannot *Heare* so well. The Cause is, for that the *Membrane* of the *Eare* is extended; And so rather casteth off the *Sound*, than draweth it to.

We *Heare* better when we hold our *Breath*, than contrary; In so much as in all *Listening* to attaine a *Sound* a farre off, Men hold their *Breath*. The Cause is, For that in all *Expiration*, the Motion is Outwards; And therefore, rather driveth away the voice, than draweth it: And besides we see, that in all *Labour* to doe things with any strength, wee hold the *Breath*: And listening after any *Sound*, that is heard with difficultie, is a kind of *Labour*.

285

Let it betried, for the *Helpe* of the *Hearing*, (and I conceive it likely to succede,) to make an *Instrument* like a *Tunnell*; The narrow Part whereof may be of the Bignesse of the Hole of the *Eare*; And the Broader End much larger, like a *Bell* at the *Skirts*; And the length half a foot, or more. And let the narrow End of it be set close to the *Eare*: And marke whether any *Sound*, abroad in the open *Aire*, will not be heard distinctly, from further distance, than without that *Instrument*; being (as it were) an *Eare-Spectacle*. And I have heard there is in *Spaine*, an *Instrument* in use to be set to the *Eare*, that helpeth somewhat those that are Thicke of *Hearing*.

286

If the *Mouth* be shut Close, neverthelesse there is yeelded by the Roof of the mouth, a *Murmur*. Such as is used by dumbe Men: But if the *Nostrills* be likewise stopped, no such *Murmur* can be made; Except it be in the Bot-  
tome



come of the Pallate towards the Throat. Whereby it appeareth manifestly, that a *Sound* in the *Mouth*, except such as aforesaid, if the *Mouth* bestopped, passeth from the *Pallate* through the *Nostrils*.

**T**He *Repercussion* of *Sounds*, (which we call *Eccho*;) is a great Argument of the *Spirituall* Essence of *Sounds*. For if it were *Corporeall*; the *Repercussion* should be created in the same manner, and by like *Instruments*, with the *Originall Sound*: But we see what a Number of *Exquisite Instruments* must concur in Speaking of Words, whereof there is no such Matter in the *Returning* of them; But onely a plain Stop, and *Repercussion*.

The *Exquisite Differences* of *Articulate Sounds*, carried along in the *Aire*, shew that they cannot be *Signatures* or *Impressions* in the *Aire*, as hath beene well refuted by the Ancients. For it is true, that *Seales* make excellent *Impressions*: And so it may be thought of *Sounds* in their first Generation: But then the *Delation* and *Continuance* of them without any new Sealing, shew apparently they cannot be *Impressions*.

All *Sounds* are suddenly made, and doe suddenly perish; But neither that, nor the *Exquisite Differences* of them, is Matter of so great Admiracion: For the *Quaverings*, and *Warblings* in *Lutes*, and *Pipes*, are as swift; And the *Tongue*, (which is no very fine Instrument,) doth in *Speech*, make no fewer *Motions*, than there be *Letters* in all the *Words*, which are uttered. But that *Sounds* should not onely be so speedily generated, but carried so farre every way, in such a momentany time, deserveth more Admiracion. As for Example; If a Man stand in the Middle of a Field, and speak aloud, he shall be heard a Furlong in round; And that shall be in *Articulate Sounds*; And those shall be Entire in every little Portion of the *Aire*; And this shall be done in the Space of lesse than a Minute.

The *Sudden Generation* and *Perishing* of *Sounds*, must be one of these two *Wayes*. Either that the *Aire* suffereth some Force by *Sound*, and then restoreth it selfe; As *Water* doth; Which being divided, maketh many *Circles*, till it restore it selfe to the naturall Consistence: Or otherwise, that the *Aire* doth willingly imbibe the *Sound* as gratefull, but cannot maintain it; for that the *Aire* hath (as it should seeme) a secret and hidden Appetite of Receiving the *Sound* at the first; But then other *Grosse* and more *Materiate Qualities* of the *Aire* straight-ways suffocate it; Like unto *Flame*, which is generated with *Alacrity*, but straight quenched by the Enmity of the *Aire*, or other *Ambient Bodies*.

There be these *Differences* (in generall) by which *Sounds* are divided; 1. *Musicall*, *Immusicall*; 2. *Treble*, *Base*; 3. *Flat*, *Sharpe*; 4. *Soft*, *Loud*; 5. *Exteriour*, *Interiour*; 6. *Cleane*, *Harsh* or *Purling*; 7. *Articulate*, *Inarticulate*.

We have laboured (as may appear) in this *Inquisition* of *Sounds*, diligently; Both because *Sound* is one of the most Hidden Portions of *Nature*, (as we said in the beginning;) And because it is a *Vertue* which may be called *Incorporeal*, and *Immateriate*; whereof there be in *Nature* but few. Besides, we were willing, (now in these our first Centuries,) to make a *Patterne* or *President* of an

Experimente  
in Consort  
touching the  
*Spiritual* and  
Fine Nature  
of *Sounds*.

287

288

289

290



*Exact Inquisition*; And wee shall doe the like hereafter in some other Subjects which require it. For we desire that Men should learne and perceive, how severe a Thing the true *Inquisition* of Nature is; And should accustome themselves, by the light of Particulars, to enlarge their Mindes, to the Amplitude of the World; and not reduce the World to the Narrownessse of their Mindes.

Experiment  
Solitary touching the  
Orient Colours, in  
Dissolution of  
Metalls.

291

**M**etalls give *Orient* and *Fine Colours* in *Dissolutions*; As *Gold* giveth an excellent *Yellow*; *Quick-Silver* an excellent *Greene*; *Tinne* giveth an excellent *Azure*: Likewise in their *Putrefactions*, or *Rusts*; As *Vermilion*, *Verdegrease*, *Bise*, *Cirrus*, &c. And likewise in their *Virifications*. The Cause is, for that by their Strength of Body, they are able to endure the Fire, or Strong Waters, and to be put into an Equall Posture; And againe to retain Part of their principall Spirit; Which two Things, (Equall Posture, and Quick Spirits) are required chiefly, to make Colours lightsome.

Experiment  
Solitary touching  
Prolongation of Life.

292

**I**T conduceth unto *Long Life*, and to the more Placide Motion of the Spirits, which thereby do lesse prey and consume the Juyce of the Body; Either that *Mens Actions* be free and voluntary; that nothing be done *Invita Minerva*, but *Secundum genium*: Or on the other side, that the *Actions* of Men be full of Regulation, and Commands within themselves: For then the Victory and Performing of the Command, giveth a good Disposition to the Spirits; Especially if there be a Proceeding from Degree to Degree; For then the Sense of Victory is the greater. An example of the former of these, is in a Countrey life; And of the latter, in *Monkes* and *Philosophers*, and such as do continually enjoyne themselves.

Experiment  
Solitary touching  
Appetite of Union in  
Bodies.

293

**I**T is certaine, that in all Bodies, there is an appetite of Union, and Evitation of Solution of Continuity: And of this Appetite there be many Degrees; But the most Remarkable, and fit to be distinguished, are three. The first in *Liquours*; The second in *Hard Bodies*: And the third in *Bodies Cleaving* or *Tenacious*. In *Liquours*, this Appetite is weak: We see in *Liquours*, the Threading of them in *Stillicides*, (as hath been said;) The Falling of them in *Round Drops*, (which is the forme of Union;) And the Staying of them, for a little time, in *Bubbles* and *Froth*. In the second Degree or Kinde, this Appetite is strong; As in *Iron*, in *Stone*, in *Wood*, &c. In the third, this Appetite is in a Medium between the other two: For such Bodies doe partly follow the Touch of another Body; And partly sticke and continue to themselves; And therefore they roape, and draw themselves in Threds; As wee see in *Pitch*, *Glew*, *Birdlime*, &c. But note, that all Solide Bodies are Cleaving, more or lesse: and that they love better the Touch of somewhat that is Tangible, than of Aire. For *Water*, in small quantitie, cleaveth to any Thing that is Solide; And so would *Metall* too, if the weight drew it not off. And therefore *Gold Foliate*, or any *Metall Foliate*, cleaveth: But those Bodies which are noted to be Clammy, and Cleaving, are such, as have a more indifferent Appetite (at once,) to follow another Body; And to hold to themselves. And therefore they are commonly Bodies ill mixed; And which take more pleasure in a Forrain Body, than in preserving their own Consistence; And which have little predominance in Drought or Moisture.



**T**ime, and Heat, are Fellows in many Effects. Heat drieth Bodies, that do easily expire; As Parchment, Leaves, Roots, Clay, &c. And, so doth Time or Age arefie; As in the same Bodies, &c. Heat dissolveth and melteth Bodies, that keep in their Spirits; As in divers *Liquefactions*; And so doth Time, in some Bodies of a softer Consistence: As is manifest in Honey, which by Age waxeth more liquid; And the like in Sugar; And so in old Oyle, which is ever more cleare, and more hot in Medicinable use. Heat causeth the Spirits to search some Issue out of the Body; As in the *Volatility* of Metals; And so doth Time; As in the *Rust* of Mettalls. But generally Heat doth that in small time, which Age doth in long.

Experiment  
Solitary touching the like  
Operations of  
Heat, and Time  
294

**S**ome Things which passe the Fire are softest at first, and by Time grow Shad; As the Crumme of Bread. Some are harder when they come from the Fire, and afterwards give againe, and grow soft, as the Crust of Bread, Bisket, Sweet Meats, Salt, &c. The Cause is, for that in those things which waxe Hard with Time, the Work of the Fire is a Kinde of *Melting*: And in those that waxe Soft with Time, (contrariwise,) the work of the Fire is a Kinde of *Baking*; And whatsoever the Fire baketh, Time doth in some degree dissolve.

Experiment  
Solitary touching the dif-  
fering Operati-  
ons of Fire,  
and Time.  
295

**M**otions passe from one Man to another, not so much by Exciting I-magination; as by Invitation; Especially if there be an Aptnesse or Inclination before. Therefore *Gaping*, or *Yawning*, and *Stretching* doe passe from Man to Man; For that that causeth *Gaping* and *Stretching* is, when the Spirits are a little Heavy, by any Vapour, or the like. For then they strive (as it were,) to wring out, and expell that which loadeth them. So Men drowzy, and desirous to sleep; Or before the Fit of an Ague; doe use to Yawne and Stretch; And doe likewise yeeld a *Voyce* or *Sound*, which is an *Interjection* of *Expulsion*: So that if another be apt and prepared to doe the like, he followeth by the Sight of another. So the *Laughing* of another maketh to *Laugh*.

Experiment  
Solitary, tou-  
ching *Motions*  
by Imitation.  
296

**T**here be some knowne Diseases that are *Infectious*; And Others that are not. Those that are *Infectious*, are; First, such as are chiefly in the Spirits, and not so much in the Humours; And therefore passe easily from Body to Body: Such are *Pestilences*, *Lippitudes*, and such like. Secondly, such as Taint the Breath; Which we see passeth manifestly from Man to Man; And not invible, as the Affects of the Spirits doe: Such are *Consumptions* of the Lungs, &c. Thirdly, such as come forth to the Skinne; And therefore taint the Aire, or the Body Adjacent; Especially if they consist in an Unctuious Substance, not apt to dissipate; Such are *Scabs*, & *Leprosie*. Fourthly, such as are meerly in the Humours, and not in the Spirits, Breath, or Exhalations: And therefore they never infect, but by Touch onely; And such a Touch, also as commeth within the *Epidermis*; As the venome of the French Poxe; And the Biting of a Mad Dog.

Experiment  
Solitary  
touching *Infe-  
ctious Diseases*.  
297

**M**ost Powders grow more Close and Coherent by Mixture of water than by Mixture of Oyle, though Oyle be the thicker Body; As Meale, &c. The Reason is the Congruitie of Bodies; which if it be more, maketh a Perfecter Imbibition, and Incorporation; Which in most Powders is more between Them and water, then between Them and Oyle: But Painters Colours ground, and Ashes, doe better incorporate with Oyle.

Experiment  
Solitary tou-  
ching the In-  
corporation of  
Powders, and  
Liquours.  
298



Experiment  
Solitary  
touching Ex-  
ercise of the  
Body.

299

**M**uch *Motion* and *Exercise* is good for some *Bodies*; And *Sitting*, and *lesse Motion* for others. If the *Body* be *Hot*, and *Void* of *Superfluous Moistures*, too much *Motion* hurteth: And it is an *Errour* in *Physicians*, to call too much upon *Exercise*. Likewise men ought to beware, that they use not *Exercise*, and a *Spare Diet* both: But if much *Exercise*, then a *Plenisfull Diet*; And if *Sparing Diet*, then little *Exercise*. The *Benefits* that come of *Exercise* are, First, that it sendeth *Nourishment* into the *Parts* more forcibly. Secondly, that it helpeth to *Excerne* by *Sweat*, and so maketh the *Parts* assimilate the more perfectly. Thirdly, that it maketh the *Substance* of the *Body* more *Solide* and *Compact*; And so lesse apt to be *Consumed* and *Depredated* by the *Spirits*. The *Evills* that come of *Exercise*, are: First, that it maketh the *Spirits* more *Hot* and *Predatory*. Secondly, that it doth *absorbe* likewise, and *attenuate* too much the *Moisture* of the *Body*. Thirdly, that it maketh too great *Concussion*, (especially if it be violent,) of the *Inward Parts*; which delight more in *Rest*. But generally *Exercise*, if it bee much, is no *Friend* to *Prolongation of Life*; Which is one *Cause*, why *Women* live longer then *Men*, because they stirre lesse.

Experiment  
Solitary, touch-  
ing Meats  
that induce  
Satiety.

300

**S**ome *Food* wee may use *long*, and *much*, without *Glutting*; As *Bread*, *Flesh* that is not *fat*, or *ranck*, &c. Some other, (though pleasant,) *Glut-tereth* sooner; As *Sweet Meats*, *Fat Meats*, &c. The *Cause* is, for that *Appetite* consisteth in the *Emptiness* of the *Mouth* of the *Stomack*; Or possessing it with somewhat that is *Astringent*; And therefore *Cold* and *Drie*. But things that are *Sweet* and *Fat*, are more *Filling*: And do swimme and hang more about the *Mouth* of the *Stomack*; And go not down so speedily: And again turn sooner to *Choler*, which is *hot*, and ever abateth the *Appetite*. We see also, that another *Cause* of *Satiety*, is an *Over-Custom*; and of *Appetite* is *Novelty*: And therefore *Meats*, if the same be continually taken, induce *Loathing*. To give the *Reason* of the *Distaste* of *Satiety*, and of the *Pleasure* in *Novelty*; and to distinguish not onely in *Meats* and *Drinkes*, but also in *Motions*, *Loves*, *Company*, *delights*, *Studies*, what they be that *Custom* maketh more gratefull; And what more tedious; were a large *Field*. But for *Meats*, the *Cause* is *Attraction*, which is quicker, and more excited towards that which is new, than towards that whereof there remaineth a *Relish* by former use. And (generally) it is a *Rule*, that whatsoever is somewhat *Ingrate* at first, is made *Gratefull* by *Custom*; But whatsoever is too *Pleasing* at first, groweth quickly to *satiety*.

NATU-





# NATVRALL HISTORIE.

## IV. Century.

**A**CCELERATION of *Time*, in *Works of Nature*, may well be esteemed *Inter Magnalia Naturæ*. And even in *Divine Miracles*, *Accelerating of the Time*, is next to the *Creating of the Matter*. We will now therefore proceed to the Enquiry of it: And for *Acceleration of Germination*, we will referre it over unto the place, where we shall handle the Subject of *Plants*, generally; And will now begin with other *Accelerations*.

*Liquours* are (many of them,) at the first, thicke and troubled; As *Must*, *Wort*, *Iuyces of Fruits*, or *Hearbs* expressed, &c. And by *Time* they settle, and Clarifie. But to make them cleare, before the *Time*, is a great Work; For it is a Spurre to Nature, and putteth her out of her pace: And besides, it is of good use, for making *Drinkes*, and *Sauces*, Potable, and Serviceable, speedily; But to know the *Meanes of Accelerating Clarification*, we must first know the *Causes of Clarification*. The first Cause is, by the *Separation of the Grosser Parts of the Liquour*, from the *Finer*. The second, by the *Equall Distribution of the Spirits of the Liquour*, with the *Tangible Parts*: For that ever representeth Bodies Cleare and Untroubled. The third, by the *Refining the Spirit in Selfe*, which thereby giveth to the *Liquour* more Splendour, and more Lustre.

First, for *Separation*; It is wrought by *weight*; As in the ordinary Residence or Settlement of *Liquours*: By *Heat*: By *Motion*: By *Precipitation*, or *Sublimation*; (That is, a Calling of the severall Parts, either up, or downe, which is a kinde of *Attraction*;) By *Adhesion*; As when a Body more *Viscous* is mingled and agitated with the *Liquour*; which *Viscous Body* (afterwards severed) draweth with it the grosser Parts of the *Liquour*: And Lastly, By *Percolation* or *Passage*.

Secondly,

Experiments  
in Confort,  
touching the  
Clarification of  
*Liquours*, and  
the Accelerating  
thereof.

301

302



303 Secondly, for the *Even Distribution* of the *Spirits*; It is wrought By *Gentle Heat*; And By *Agitation* or *Motion*; (For of *Time* we speak not, because it is that, we would anticipate and represent:) And it is wrought also, By *Mixture* of some other *Body*, which hath a vertue to open the *Liquour*, and to make the *Spirits* the better passe thorow.

304 Thirdly, for the *Refining* of the *Spirit*, it is wrought likewise By *Heat*; By *Motion*; And By *Mixture* of some *Body* which hath *Vertue* to attenuate. So therefore (having shewen the *Causes*) for the *Accelerating* of *Clarification*, in generall, and the *Enducing* of it; take these *Instances*, and *Trials*.

305 It is in common Practice, to draw *Wine*, or *Beere*, from the *Lees*, (which we call *Racking*;) whereby it will *Clarifie* much the sooner: For the *Lees*, though they keep the *Drink* in Heart, and make it lasting; yet withall they cast up some *Spissitude*: And this *Instance* is to be referred to *Separation*.

306 On the other side, it were good to trie, what the Adding to the *Liquour* more *Lees* than his owne will worke; For though the *Lees* doe make the *Liquour* turbide, yet they refine the *Spirits*. Take therefore a Vessell of *New Beere*; And take another Vessell of *New Beere*, and Rack the one Vessel from the *Lees*, and powre the *Lees* of the Racked Vessell into the unracked Vessell, and see the Effect: This *Instance* is referred to the *Refining* of the *Spirits*.

307 Take *New Beere*, and put in some Quantitie of *Stale Beere* into it, and see whether it will not accelerate the *Clarification*, by Opening the Body of the *Beere*, and Cutting the Groffer Parts, whereby they may fall down into *Lees*. And this *Instance* again is referred to *Separation*.

308 The longer *Mali*, or *Herbs*, or the like, are Infused in *Liquour*, the more thick and troubled the *Liquour* is; But the longer they be decocted in the *Liquour*, the clearer it is. The reason is plaine, because in *Infusion*, the longer it is, the greater is the Part of the Groffe Body, that goeth into the *Liquour*: But in *Decoction*, though more goeth forth, yet it either purgeth at the Top, or setteth at the Bottome. And therefore the most Exact Way to *Clarifie* is; First to *Infuse*, and then to take off the *Liquour*, and *Decoct* it; as they doe in *Beere*, which hath *Mali* first infused in the *Liquour*, and is afterwards boiled with the Hop. This also is referred to *Separation*.

309 Take *Hot Embers*, and put them about a Bottle filled with *New Beere*, almost to the very Neck: Let the Bottle be well stopped, lest it flie out: And continue it, renewing the *Embers* every day, by the space of Ten Dayes; and then compare it with another Bottle of the same *Beer* set by. Take also *Lime* both *Quenched*, and *Vnquenched*, and set the Bottles in them, *ut supra*. This *Instance* is referred, both to the *Even Distribution*, and also to the *Refining* of the *Spirits* by *Heat*.

310 Take *Bottles*, and *Swing* them; Or *Carry* them in a *whee-Barrow*, upon *Rough Ground*; twice in a day: But then you may not fill the *Bottles* full, but leave some *Aire*; For if the *Liquour* come close to the Stopple, it cannot play, nor flower: And when you have shaken them well, either way, poure the *Drinke* into another Bottle, stopped close, after the usuall manner; For if it stay with much *Aire* in it, the *Drinke* will pall; neither will it settle so perfectly in all the Parts. Let it stand some 24 houres: Then take it, and put it again into a *Bottle* with *Aire*, *ut supra*: And thence into a *Bottle Stopped ut supra*: And so repeat the same Operation for seven dayes. Note that in the Emptying of one Bottle into another, you must doe it swiftly, lest the *Drinke* pall. It were good also, to trie it in a *Bottle* with a little *Aire* below the Neck, without Emptying. This *Instance* is referred to the *Even Distribution* and *Refining* of the *Spirits* by *Motion*.



As for *Percolation*, *Inward*, and *Outward*, (which belongeth to *Separation*;) Triall would be made, of *Clarifying* by *Adhesion*, with *Milke* put into *New-Beere*, and stirred with it: For it may be that the *Grosser Part* of the *Beere* will cleave to the *Milke*: The *Doubt* is, whether the *Milke* will sever well againe; Which is soone tried. And it is usuall in *Clarifying Ippocrasse* to put in *Milke*; Which after severeth and carrieth with it the *Grosser Parts* of the *Ippocrasse*, as hath beene said elsewhere. Also for the better *Clarification* by *Percolation*, when they run *New Beere*, they use to let it passe through a *Strainer*; And it is like the finer the *Strainer* is, the clearer it will be.

The *Accelerating* of *Maturation* we will now enquire of. And of *Maturation* it selfe. It is of three *Natures*. The *Maturation* of *Fruits*: The *Maturation* of *Drinckes*: And the *Maturation* of *Impostumes*, and *Vlcers*. This last we referre to another Place, where we shall handle *Experiments Medicinall*. There be also other *Maturations*, as of *Metals*, &c. whereof we will speake as *Occasion* serveth. But we will begin with that of *Drinckes*, because it hath such *Affinitie* with the *Clarification* of *Liquours*.

For the *Maturation* of *Drinks*, it is wrought by the *Congregation* of the *Spirits* together, whereby they digest more perfectly the *Grosser Parts*: And it is effected partly, by the same meanes, that *Clarification* is, (whereof we spake before;) But then note, that an *Extreme Clarification* doth spread the *Spirits* so *Smooth*, as they become *Dull*, and the *Drinke* dead, which ought to have a little *Flouring*. And therefore all your *Cleare Amber Drinke* is flat.

Wee see the *Degrees* of *Maturation* of *Drinckes*; In *Must*; In *Wine*, as it is drunke; And in *Vinegar*. Whereof *Must* hath not the *Spirits* well *Congregated*; *Wine* hath them well united; so as they make the *Parts* somewhat more *Oylie*: *Vinegar* hath them *Congregated*, but more *Jesune*, and in smaller *Quantity*; The greatest and finest *Spirit* and *Part* being exhaled: For we see *Vinegar* is made by setting the *Vessell* of *Wine* against the hot *Sunne*: And therefore *Vinegar* will not burne; For that much of the *Finer Parts* is exhaled.

The *Refreshing* and *Quickning* of *Drinke* Palled, or Dead, is by *Enforcing* the *Motion* of the *Spirit*: So we see that *Open Weather* relaxeth the *Spirit*, and maketh it more lively in *Motion*. We see also *Bottelling* of *Beere*, or *Ale*, while it is *New*, and full of *Spirit*, (so that it spirteth when the *Stopples* is taken forth) maketh the *Drinke* more quick and windie. A *Pan* of *Coales* in the *Cellar* doth likewise good, and maketh the *Drinke* worke againe. *New Drinke* put to *Drinke* that is *Dead*, provoketh it to worke againe: Nay, which is more, (as some affirme,) A *Brewing* of *New Beere*, set by *Old Beere*, maketh it worke againe. It were good also to *Enforce* the *Spirits* by some *Mixtures*, that may excite and quicken them; As by putting into the *Bottles*, *Nitre*, *Chalke*, *Lime*, &c. We see *Creame* is *Matured*, and made to rise more speedily, by Putting in *Cold Water*; which, as it seemeth, getteth downe the *Whey*.

It is tried, that the *Burying* of *Bottles* of *Drinke* well stopped, either in *drie Earth*, a good depth; Or in the *Bottom* of a *Well* within *Water*; And best of all the *Hanging* of them in a *deepe Well* somewhat above the *Water*, for some fortnights space, is an *Excellent Meanes* of making *Drinke* fresh, and quick

311

Experiments in Consort touching *Maturation*, and the *Accelerating* thereof. And first touching the *Maturation* and *Quickening* of *Drinks*. And next touching the *Maturation* of *Fruits*.

312

313

314

315



quick: for the Cold doth not cause any Exhaling of the *Spirits* at all; As *Heat* doth, though it rarifieth the rest that remaine: But Cold maketh the *Spirits* vigorous, and irritateth them, whereby they incorporate the Parts of the *Liquour* perfectly.

316

As for the *Maturation of Fruits*; It is wrought by the *Calling forth of the Spirits of the Body outward*, and so *Spreading* them more smoothly: And likewise by *Digesting*, in some degree, the *Grosser Parts*: And this is Effected, by *Heat*; *Motion*; *Attraction*; And by a *Rudiment of Putrefaction*: For the *Inception of Putrefaction* hath in it a *Maturation*.

317

There were taken *Apples*, and laid in *Straw*; In *Hay*; In *Flower*; In *Chalke*; In *Lime*; Covered over with *Onions*; Covered over with *Crabs*; Closed up in *wax*; Shut in a *Box*: &c. There was also an *Apple* hanged up in *Smoake*: Of all which the *Experiment* sorted in this Manner.

318

After a *Moneths Space*, the *Apple* Enclosed in *wax*, was as *Greene* and *Fresh* as at the first *Putting in*, and the *Kernells* continued *White*. The *Cause* is, for that all *Exclusion of Open Aire*, (which is ever *Predatory*) maintaineth the *Body* in his first *Freshnesse*, and *Moisture*: But the *Inconvenience* is, that it tasteth a little of the *wax*: Which, I suppose, in a *Pomgranate*, or some such thick-coated *Fruit*, it would not doe.

319

The *Apple* Hanged in the *smoake*, turned like an *Old Mellow Apple*, *Wrinkled*, *Drie*, *Soft*, *Sweet*, *Yellow* within. The *Cause* is, for that such a degree of *Heat*, which doth neither *Melt*, nor *Scorch*, (For we see that in a greater *Heat*, a *Roast Apple* Softneth and Melteth, And *Pigs feet*, made of *Quarters of Wardens*, scorch and have a skinne of *Cole*) doth *Mellow*, and not *Adure*: The *Smoake* also maketh the *Apple* (as it were) sprinkled with *Soot*, which helpeth to *Mature*. We see that in *Drying of Peares*, and *Prunes*, in the *Oven*, and *Removing of them* often as they begin to *Sweat*, there is a like *Operation*; But that is with a farre more *Intense degree of Heat*.

320

The *Apples* covered in the *Lime* and *Ashes*, were well *Matured*; As appeared both in their *Yellownesse*, and *Sweetnesse*. The *Cause* is, for that that *Degree of Heat* which is in *Lime*, and *Ashes*, (being a *Smothering Heat*) is of all the rest most *Proper*; for it doth neither *Liquefie*, nor *Arefie*; And that is true *Maturation*. Note that the *Taste of those Apples* was good; And therefore it is the *Experiment* fittest for *Use*.

321

The *Apples*, Covered with *Crabs*, and *Onions*, were likewise well *Matured*. The *Cause* is, not any *Heat*; But for that the *Crabs* and the *Onions* draw forth the *Spirits of the Apple*, and spread them equally thorowout the *Body*; which taketh away *Hardnesse*. So we see one *Apple* ripeneth against another. And therefore in making of *Cider*, they turne the *Apples* first upon a heape. So one *Cluster of Grapes*, that toucheth another whilest it groweth, ripeneth faster; *Botrus contra Botrum citius maturescit*.

322

The *Apples* in *Hay*, and the *Straw*, ripened apparently, though not so much as the *Other*; But the *Apple* in the *Straw* more. The *Cause* is, for that the *Hay* and *Straw* have a very low degree of *Heat*, but yet *Close* and *Smothering*, and which drieth not.

323

The *Apple* in the *Close Box*, was ripened also: The *Cause* is, for that all *Aire*, kept close, hath a degree of *Warmth*: As we see in *wool*, *Fur*, *Plush*, &c.

324

Note that all these were Compared with another *Apple*, of the same kind, that lay of it *Selfe*: And in *Comparison of that*, were more *Sweet*, and more *Yellow*, and so appeared to be more *Ripe*.

Take an *Apple*, or *Pear*, or other like *Fruit*, and *Rowle* it upon a *Table hard*: Wee see in *Common Experience*, that the *Rowling* doth *Softnen* and *Sweeten*



Sweeten the *Fruit* presently; Which is Nothing but the *Smooth Distribution* of the *Spirits* into the Parts: For the *Vnequall Distribution* of the *Spirits* maketh the Harshnesse: But this Hard *Rowling* is betweene *Concoction*, and a *Simple Maturation*; Therefore, if you should *Rowle* them but gently, perhaps twice a day; And continue it some seven dayes, it is like they would *mature* more finely, and like unto the *Naturall Maturation*.

Take an *Apple*, and cut out a Peece of the Top, and cover it, to see whether that *Solution of Continuitie* will not hasten a *Maturation*: We see that where a *Waspe*, or a *Flie*, or a *Worme* hath bitten, in a *Grape*, or any *Fruit*, it will sweeten hastily.

Take an *Apple*, &c. and prick it with a *Pin* full of *Holes*, not deep and smear it a little with *Sacke*, or *Cinnamon Water*, or *Spirit of Wine*, every day for ten dayes, to see if the *Virtuall Heat* of the *Wine*, or *Strong Waters*, will not *Mature* it.

In these *Trialls* also, as was used in the first, set another of the same *Fruits* by, to Compare them: And trie them, by their *Yellownesse*, and by their *Sweetnesse*.

The World hath been much abused by the Opinion of *Making of Gold*: The *Worke* it selfe I judge to be possible; But the *Meanes* (hitherto propounded) to effect it, are, in the Practice, full of Errour and Imposture; And in the Theory, full of unsound Imaginations. For to say, that *Nature* hath an Intention to make all *Metals Gold*; And that, if she were delivered from Impediments, shee would performe her owne *Worke*; And that, if the *Crudities*, *Impurities*, and *Leprosities* of *Metals* were cured, they would become *Gold*; And that a little *Quantity* of the *Medicine*, in the *Worke* of *Projection*, will turne a Sea of the *Basest Metall* into *Gold*, by *Multiplying*: All these are but dreames: And so are many other Grounds of *Alchymy*. And to help the Matter, the *Alchymists* call in likewise many Vanities, out of *Astrology*; *Naturall Magicke*; Superstitious Interpretations of *Scriptures*; *Auricular Traditions*; Faigned Testimonies of *Ancient Authors*; And the like. It is true, on the other side, they have brought to light not a few profitable *Experiments*, and thereby made the World some amends. But we, when we shall come to handle the *Version & Transmutation* of *Bodies*; And the *Experiments* concerning *Metals*, and *Mineralls*; will lay open the true Wayes and Passages of *Nature*, which may lead to this great Effect. And we commend the wit of the *Chineses*, who despaire of *Making of Gold*, but are Mad upon the *Making of Silver*: For certain it is, that it is more difficult to make *Gold*, (which is the most Ponderous and Materiate amongst *Metalls*) of other *Metalls*, lesse Ponderous, and lesse Materiate; than (*viâ versâ*) to make *Silver* of *Lead*, or *Quick-Silver*; Both which are more Ponderous than *Silver*; So that they need rather a further

325

326

Experiment  
Solitary, touching the  
Making of Gold.



ther Degree of *Fixation*, than any *Condensation*. In the meane time, by Occasion of Handling the *Axiomes* touching *Maturati-on*, we will direct a *Trial* touching the *Maturing* of *Metalls*, and thereby turning some of them into *Gold*: For wee conceive indeed, that a perfect good *Concoction*, or *Disgestion*, or *Maturati-on* of some *Metalls*, will produce *Gold*. And here wee call to minde, that we knew a *Dutch-man*, that had wrought himselfe into the beleefe of a great Person, by undertaking that he could make *Gold*: Whose discourse was, that *Gold* might be made; But that the *Alchymists* Over-fired the Worke: For (he said) the *Making* of *Gold* did require a very temperate *Heat*, as being in *Nature* a Subterrany worke, where little *Heat* commeth; But yet more to the *Making* of *Gold*, than of any other *Metall*; And therefore, that he would doe it with a great *Lamp*, that should carry a Temperate and Equall *Heat*: And that it was the Work of many Moneths. The Device Of the *Lampe* was folly; But the Over-firing now used; And the Equall *Heat* to be required; And the *Making* it a Worke of some good Time; are no ill Discourses.

We resort therefore to our *Axiomes* of *Maturation*, in Effect touched before. The First is, that there be used a *Temperate Heat*; For they are ever *Temperate Heats* that *Disgest*, and *Mature*: Wherein we meane *Temperate*, according to the *Nature* of the *Subject*; For that may be *Temperate* to *Fruits*, and *Liquours*, which will not worke at all upon *Metalls*. The Second is, that the *Spirit* of the *Metall* be quickened, and the *Tangible Parts* opened: For without those two Operations, the *Spirit* of the *Metall*, wrought upon, will not be able to digest the parts. The Third is, that the *Spirits* doe spread themselves Even, and move not *Subsultorily*; For that will make the Parts Close, and Pliant. And this requireth a *Heat*, that doth not rise and fall, but continue as *Equall* as may be. The Fourth is, that no *Part* of the *Spirit* be emitted, but detained: For if there be *Emission* of *Spirit*, the Body of the *Metall* will be Hard, and Churlish. And this will be performed, partly by the Temper of the Fire; And partly by the closeness of the Vessell. The Fifth is, that there be *Choice* made of the likeliest and best prepared *Metall*, for the *Version*: For that will facilitate the Worke. The Sixth is, that you give *Time enough* for the *Worke*: Not to prolong Hopes (as the *Alchymists* doe;) but indeed to give *Nature* a convenient Space to worke in. These Principles are most certaine, and true; Wee



We will now derive a direction of *Triall* out of them ; Which may (perhaps) by further Meditation, be improved.

Let there be a *Small Furnace* made, of a *Temperate Heat* ; Let the *Heat* be such, as may keep the *Metall* perpetually *Molten*, and no more ; For that above all importeth to the Work. For the *Materiall*, take *Silver*, which is the *Metall* that in Nature Symbolizeth most with *Gold* ; Put in also, with the *Silver*, a Tenth Part of *Quick-silver*, and a Twelfth Part of *Nitre*, by weight ; Both these to quicken and open the Body of the *Metall* : And so let the Worke be continued by the *Space of Sixe Moneths*, at the least. I wish also, that there be, at some times, an Injection of some *Oyled Substance* ; Such as they use in the Recovering of *Gold*, which by Vexing with Separations hath beene made Churlish : And this is, to lay the Parts more Close and Smooth, which is the Main Work. For *Gold* (as we see) is the Closest (and therefore the Heaviest) of *Metalls* : And is likewise the most Flexible, and Tensible. Note, that to thinke to make *Gold* of *Quick-silver*, because it is the heaviest, is a Thing not to be hoped ; For *Quick-silver* will not endure the Manage of the *Fire*. Next to *Silver*, I thinke *Copper* were fittest to bee the *Materiall*.

*Gold* hath these *Natures* : *Greatnesse of Weight* ; *Closenesse of Parts* ; *Fixation* ; *Pliannesse*, or *Sofinesse* ; *Immunitie from Rust* ; *Colour* or *Tincture of Yellow*. Therefore the Sure Way, (though most about,) to make *Gold*, is to know the *Causes* of the Severall *Natures* before rehearsed, and the *Axiomes* concerning the same. For if a man can make a *Metall*, that hath all these *Properties*, Let men dispute, whether it be *Gold*, or no ?

The *Enducing* and *Accelerating* of *Putrefaction*, is a Subject of a very Universall Enquiry : For *Corruption* is a Reciprocall to *Generation* : And they Two, are as *Natures* two *Termes* or *Boundaries* ; And the *Guides* to *Life* and *Death*. *Putrefaction* is the Worke of the *Spirits* of *Bodies*, which ever are Unquiet to Get forth, and Congregate with the *Aire*, and to enjoy the *Sunbeames*. The *Getting forth*, or Spreading of the *Spirits*, (which is a Degree of *Getting forth*,) hath five Differing *Operations*. If the *Spirits* be detained within the Bodie, and move more violently, there followeth *Colliquation* ; As in *Metalls*, &c. If more Mildely, there followeth *Disgestion*, or *Maturation* ; As in *Drinckes*, and *Fruits*. If the *Spirits* be not meerly Detained, but Protrude a little, and that Motion be Confused, and inordinate, there followeth *Putrefaction* ; Which ever dissolveth the Consistence of the Body into much Inequalitie ; As in *Flesh*, *Rotten Fruits*, *Shining Wood*, &c. And also in the *Rust* of *Metalls*. But if that Motion be in a certain Order, there followeth *Vivification*, and *Figuration* ; As both in *Living Creatures* bred of *Putrefaction*, and in *Living Creatures Perfect*. But if the *Spirits* issue out of

327

Experiment  
Solitary touch-  
ing the Nature  
of Gold.

328

Experiments  
in Consort,  
touching the  
Enducing and  
Accelerating of  
Putrefaction.



the Body, there followeth *Deficcation, Induration, Consumption,* &c. As in *Bricke, evaporation of Bodies Liquid, &c.*

329 The *Meanes* to *Enduce* and *Accelerate Putrefaction*, are; First by *Adding* some *Crude* or *Watry Moisture*; As in *Wetting* of any *Flesh, Fruit, Wood,* with *Water, &c.* For contrariwise *Enduous* and *Oily Substances* preserve.

330 The *Second* is by *Invitation* or *Excitation*; As when a *Rotten Apple* lyeth close to another *Apple* that is *Sound*: Or when *Dung* (which is a *Substance* already *Putrified*) is added to other *Bodies*. And this is also notably seene in *Church-yards*, where they bury much; Where the *Earth* will consume the *Corps*, in farre shorter time, than other *Earth* will.

331 The *Third* is, by *Glofenesse*, and *Stopping*, which detaineth the *Spirits*, in *Prison*, more than they would; And thereby irritateth them to seek *Issue*; As in *Corne*, and *Cloaths*, which waxe *Musty*; and therefore *Open Aire*, (which they call *Aer persflabilis*) doth preserve: And this doth appeare more evidently in *Agues*, which come (most of them,) of *Obstructions*, and *Penning* the *Humours*, which thereupon *Putrife*.

332 The *Fourth* is, by *Solution of Continuittie*; As we see an *Apple* will rot sooner, if it be *Cut* or *Pierced*; And so will *Wood, &c.* And so the *Flesh* of *Creatures* alive, where they have received any *Wound*.

333 The *Fifth* is, either by the *Exhaling*, or by the *Driving back* of the *Principall Spirits*, which preserve the *Consistence* of the *Body*; So that when their *Government* is dissolved, every *Part* returneth to his *Nature*, or *Homogeny*. And this appeareth in *Urine*, and *Bloud*, when they coole, and thereby breake; It appeareth also in the *Gangrene*, or *Mortification* of *Flesh*, either by *Opiates*, or by *Intense Colds*. I conceive also the same *Effect* is in *Pestilences*, for that the *Malignitie* of the *Infecting Vapour*, daunceth the *Principall Spirits*, and maketh them flie, and leave their *Regiment*; And then the *Humours, Flesh*, and *Secondary Spirits*, doe dissolve, and breake, as in an *Anarchy*.

334 The *Sixth* is, when a *Forraine Spirit*, *Stronger* and *more Eager* than the *Spirit* of the *Body*, entreth the *Body*; As in the *Stinging* of *Serpents*. And this is the *Cause* (generally) that upon all *Poysons* followeth *Swelling*: And we see *Swelling* followeth also, when the *Spirits* of the *Body* it self, Congregate too much; As upon *Blowes*, and *Bruises*; Or when they are *Pent in too much*, as in *Swelling* upon *Cold*. And we see also, that the *Spirits* coming of *Putrefaction* of *Humours* in *Agues, &c.* Which may bee counted as *Forraine Spirits*, though they be bred within the *Body*, do *Extinguish* and *Suffocate* the *Naturall Spirits*, and *Heat*.

335 The *Seventh* is, by such a *Weak Degree* of *Heat*, as setteth the *Spirits* in a *little Motion*, but is not able, either to *digest* the *Parts*, or to *Issue* the *Spirits*; As is seene in *Flesh* kept in a *Roome* that is not *Coole*; Whereas in a *Coole* and *Wet Larder* it will keep longer. And we see, that *Vivification* (whereof *Putrefaction* is the *Bastard Brother*), is effected by such *Soft Heats*; As the *Hatching* of *Egges*; The *Heat* of the *Wombe, &c.*

336 The *Eight* is, by the *Releasing* of the *Spirits*; which before were close kept by the *Solidnesse* of their *Coverture*, and thereby their *Appetite* of *Issuing* checked; As in the *Artificiall Rusts* induced by strong *Waters*, in *Iron, Lead, &c.* And therefore *Wetting* hasteneth *Rust*, or *Putrefaction* of any thing, because it softneth the *Crust*, for the *Spirits* to come forth.

337 The *Ninth* is, by the *Enterchange* of *Heat* and *Cold*, or *Wet* and *Dry*; As we see in the *Mouldring* of *Earth* in *Frosts*, and *Sunne*; And in the more hasty *Rotting* of *Wood*, that is sometimes wet, sometimes dry.



The Tenth is, by *Time*, and the *Worke and Procedure of the Spirits themselves*, which cannot keep their Station; Especially if they be left to themselves; And there be not Agitation or Locall Motion. As we see in Corn not stirred; And Mens Bodies not exercised.

338

All *Moulds* are Inceptions of *Putrefaction*; As the *Moulds* of *Pyes*, and *Flesh*; the *Moulds* of *Orenges*, and *Lemons*; which *Moulds* afterwards turn into Wormes, or more odious *Putrefactions*: And therefore (commonly) prove to be of ill Odour. And if the Body be Liquid, and not apt to putrifie totally, it will cast up a *Mother* in the Top; As the *Mothers* of *Distilled Waters*.

339

*Mosse* is a Kinde of *Mould*, of the Earth, and Trees. But it may be better sorted as a *Rudiment* of *Germination*; To which we referre it.

340

It is an *Enquiry* of Excellent use, to Enquire of the *Meanes* of *Preventing* or *Staying* of *Putrefaction*; For therein consisteth the *Meanes* of *Conservation* of *Bodies*; For *Bodies* have two Kindes of *Dissolutions*; The one by *Consumption*, and *Desiccation*; The other by *Putrefaction*. But as for the *Putrefactions* of the *Bodies* of *Men*, and *Living Creatures* (as in *Agues*, *Worms*, *Consumptions* of the *Lungs*, *Impostumes*, and *Ulcers* both *Inwards* and *Outwards*;) they are a great *Part* of *Physicke*, and *Surgery*; And therefore we will reserve the *Enquiry* of them to the proper Place, where wee shall handle *Medicinall Experiments* of all Sorts. Of the rest wee will now Enter into an *Enquiry*: wherein much light may be taken, from that which hath beene said, of the *Meanes* to *Enduce* or *Accelerate Putrefaction*: For the *Removing* that, wich caused *Putrefaction*, doth *Prevent* and *Avoid Putrefaction*.

Experiments  
in Consort,  
touching Pro-  
hibiting and  
Preventing Pu-  
trification.

The First *Meanes* of *Prohibiting* or *Checking Putrefaction*, is *Cold*: For so we see that *Meat* and *Drink* will last longer, *Unputrified*, or *Unfowred*, in *Winter*, than in *Summer*: And we see that *Flowers*, and *Fruits*, put in *Conservatories* of *Snow*, keep fresh. And this worketh by the *Detention* of the *Spirits*, and *Constipation* of the *Tangible Parts*.

341

The Second is *Astringency*: For *Astringency* prohibiteth *Dissolution*: As we see (generally) in *Medicines*, whereof such as are *Astringents* doe inhibit *Putrefaction*: And by the same reason of *Astringency*, some small Quantity of *Oile* of *Vitrioll*, will keep *Fresh Water* long from *Putrefying*. And this *Astringency* is in a Substance that hath a *Virtuall Cold*; And it worketh (partly) by the same *Meanes* that *Cold* doth.

342

The Third is, the *Excluding* of the *Aire*; And againe, the *Exposing* to the *Aire*: For these *Contraries*, (as it commeth often to passe,) worke the same Effect, according to the Nature of the Subject Matter. So we see, that *Beere*, or *Wine*, in *Bottles* close stopped, last long; That the *Garners* under *Ground* keepe *Corne* longer than those above *Ground*; And that *Fruit* closed in *wax* keepeth fresh: And likewise *Bodies* put in *Honey*, and *Flower*, keepe more fresh: And *Liquours*, *Drinkes*, and *Incises*, with a little *Oyle* cast on the Top, keepe fresh. Contrariwise, we see that *Cloth* and *Apparell*, not *Aired*, doe breed *Moathes*, and *Mould*; and the *Diversitie* is, that in *Bodies*

343



that need *Detention* of *Spirits*, the *Exclusion* of the *Aire* doth good; As in *Drinckes*, and *Corne*: But in *Bodies* that need *Emission* of *Spirits*, to discharge some of the *Superfluous Moisture*, it doth hurt, for they require *Airing*.

344 The fourth is *Motion*, and *Stirring*; For *Putrefaction* asketh *Rest*; For the *Subtill Motion*, which *Putrefaction* requireth, is disturbed by any *Agitation*; And all *Locall Motion* keepeth *Bodies* *Integrall*, and their *Parts* together; As wee see that *Turning over* of *Corne* in a *Garner*; Or *Letting* it runne like an *Houre-glasse*, from an upper *Roome* into a *Lower*, doth keepe it *Sweet*: And *Running Waters* putrifie not: And in *Mens Bodies*, *Exercise* hindreth *Putrefaction*; And contrariwise *Rest*, and *Want* of *Motion*, or *Stoppings*, (whereby the *Runne* of *Humours*, or the *Motion* of *Perspiration*, is stayed,) further *Putrefaction*; As we partly touched a little before.

345 The Fifth is, the *Breaking forth* of the *Adventitious Moisture* in *Bodies*; For as *Wetting* doth hasten *Putrefaction*; So *Convenient Drying*, (whereby the more *Radicall Moisture* is onely kept in,) putteth back *Putrefaction*: So we see that *Herbs*, and *Flowers*, if they be dried in the *Shade*; or dried in the hot *Sunne*, for a small time, keep best. For the *Emission* of the *Loose* and *Adventitious Moisture*, doth betray the *Radicall Moisture*; And carryeth it out for *Company*.

346 The Sixth is, the *Strengthening* of the *Spirits* of *Bodies*; For as a *Great Heat* keepeth *Bodies* from *Putrefaction*; But a *Tepide Heat* enclineth them to *Putrefaction*: So a *Strong Spirit* likewise preserveth, and a *Weake* or *Faint Spirit* disposeth to *Corruption*. So we finde that *Salt water* corrupteth not so soon as *Fresh*: And *Salting* of *Oysters*, and *Powdring* of *Meat*, keepeth them from *Putrefaction*. It would be tried also, whether *Chalke* put into *Water*, or *Drinke*, doth not preserve it from *Putrefying*, or speedy *Souring*. So wee see that *Strong Beere* will last longer than *Small*; And all *Things*, that are *Hot* and *Aromaticall*, doe helpe to *Preserve Liquours*, or *Powders*, &c. Which they doe, as well by *Strengthening* the *Spirits*, as by *Soaking* out the loose *Moisture*.

347 The Seventh is, *Separation* of the *Cruder Parts*, and thereby making the *Body* more *Equall*; for all unperfect *Mixture* is apt to *Putrefie*; And *Watry Substances* are more apt to *Putrefie*, than *Oily*. So wee see *Distilled Waters* will last longer than *Raw waters*; And *Things* that have passed the *Fire*, doe last longer than those that have not passed the *Fire*; as *Dried Peares*, &c.

348 The Eighth is, the *Drawing forth continually* of that part, where the *Putrefaction* beginneth: Which is (commonly) the *Loose* and *Watry Moisture*; Not onely for the Reason before given, that it provoketh the *Radicall Moisture* to come forth with it; But because being detained in the *Body*, the *Putrefaction* taking hold of it, infecteth the rest: As we see in the *Embalming* of dead *Bodies*: And the same Reason is of *Preserving Herbs*, or *Fruits*, or *Flowers*, in *Branne*, or *Meale*.

349 The Ninth is, the *Commixture* of any *Thing* that is more *Oily*, or *Sweet*: For such *Bodies* are least apt to *Putrefie*, the *Aire* working little upon them; And they not putrefying preserve the rest. And therefore we see *Syrups*, and *Ointments*, will last longer, than *Juyces*.

350 The Tenth is, the *Commixture* of somewhat that is *Drie*; For *Putrefaction* beginneth first from the *Spirits*; And then from the *Moisture*: And that that is dry is unapt to putrefie: And therefore *Smoake* preserveth *Flesh*; As wee see in *Bacon*, and *Neats-Tongues*, and *Martlemas Beefe*, &c.



The Opinion of some of the *Ancients*, that *Blowne Aires* doe preserve Bodies, longer than other *Aires*, seemeth to mee Probable; For that the *Blowne Aires*, being Over-charged and Compressed, will hardly receive the Exhaling of any Thing, but rather repulse it. It was tried in a *Blowne Bladder*, whereinto Flesh was put, and likewise a Flower, and it sorted not. For *Dry Bladders* will not *Blow*: And *New Bladders* rather further *Putrefaction*: The way were therefore, to blow strongly, with a Paire of Bellows, into a Hog-head, putting into the Hog-head (before) that which you would have preserved; And in the instant that you withdraw the Bellows, stop the Hole close.

**T**HE Experiment of wood that *Shineth* in the *Darke*, we have diligently driven, and pursued: The rather, for that of all Things, that give Light here below, it is the most Durable; And hath least Apparent Motion. *Fire* and *Flame* are in continuall Expende; *Sugar* shineth only while it is in Scraping; And *Salt-water* while it is in Dashing; *Glow-wormes* have their Shining while they live, or a little after; Onely *Scales of Fishes* (Putrified) seeme to be of the same Nature with *Shining Wood*: And it is true, that all *Putrefaction* hath with it an Inward Motion, as well as *Fire*, or *Light*. The *Triall* sorted thus. 1. The *Shining* is in some Peeces more *Bright*, in some more *Dimme*; but the most *Bright* of all doth not attaine to the Light of a *Glow-worme*. 2. The *Woods* that have beene tried to shine, are chiefly *Sallow*, and *Willow*; Also the *Ash*, and *Haste*; It may be, it holdeth in others. 3. Both *Roots*, and *Bodies* doe shine, but the *Roots* better. 4. The *Colour* of the *Shining Part*, by Daylight, is in some Peeces *White*, in some Peeces inclining to *Red*; Which in the Countrey they call the *White*, and *Red Garret*. 5. The Part that *Shineth*, is, (for the most Part) somewhat *Soft*, and *Moist* to feele to; But some was found to be *Firme* and *Hard*; So as it might be figured into a *Crosse*, or into *Beads*, &c. But you must not look to have an Image, or the like, in any Thing that is *Lightsome*; For even a face in Iron red Hot will not be seen, the Light confounding the small differences of *Lightsome* and *Darksome*, which shew the figure. 6. There was the *Shining Part* pared off, till you came to that, that did not Shine; But within two Dayes the *Part Contiguous* began also to *Shine*, being laid abroad in the Dew; So as it seemeth the *Putrefaction* spreadeth. 7. There was other dead wood of like kinde, that was *Laid abroad*, which *Shined* not at the first; But after a Nights lying abroad began to *Shine*. 8. There was other wood, that did *First Shine*; And being laid drie in the House, within five or sixe dayes, *Lost the Shining*; And laid abroad again, *Recovered the Shining*. 9. *Shining Woods*, being laid in a *Dry Roome*, within a Seven night, lost their *Shining*; But being laid in a *Cellar*, or *Danke Roome*, kept the *Shining*. 10. The *Boring of Holes*, in that kinde of Wood, and then laying it abroad, seemeth to conduce to make it *Shine*: The Cause is, for that all *Solution of Continuity* doth help on *Putrefaction*, as was touched before. 11. No wood hath beene yet tried to *Shine*, that was cut downe alive, but such as was *Rotted*, both in *Stocke*, and *Root*, while it grew. 12. Part of the wood that *Shined*, was steeped in *Oyle*, and retained the *Shining* a Fortnight. 13. The like succeeded in some steeped in *Water*, and much better. 14. How long the *Shining* will continue, if the wood be laid abroad every Night, and taken in and *Sprinkled* with *Water* in the Day, is not yet tryed. 15. *Triall* was made of laying it abroad in *Frostie weather*, which hurt it not. 16. There was a great Peece of a *Root* which did shine, and the *Shining Part* was Cut off, till no more Shined;



Experiment  
Solitary tou-  
ching the Ac-  
celeration of  
Birth.

353

Shined ; Yet after two Nights, though it were kept in a drie Room, it got a Shining.

**T**HE Bringing forth of Living Creatures may be accelerated in two Respects : The one, if the Embryon ripeneth and perfecteth sooner : The other, if there be some Cause from the Mothers Body, of Expulsion or Putting it downe : whereof the Former is good, and argueth Strength ; The Latter is ill, and commeth by Accident or Disease. And therefore the Ancient Observation is true, that the Childe borne in the Seventh Moneth, doth commonly well ; But Borne in the Eighth Moneth, doth (for the most part) die. But the Cause assigned is Fabulous ; Which is, that in the Eighth Moneth, should be the returne of the Raigne, of the Planet Saturne : which (as they say) is a Planet Maligne ; whereas in the Seventh is the Raigne of the Moone, which is a Planet Propitious. But the true Cause is, for that where there is so great a Prevention of the Ordinary time, it is the lustinesse of the Childe ; But when it is lesse, it is some indisposition of the Mother.

Experiment  
Solitary tou-  
ching the Ac-  
celeration of  
growth and  
Stature.

354

**T**O Accelerate Growth or Stature, it must proceed ; Either from the Plenty of the Nourishment ; Or from the Nature of the Nourishment ; Or from the Quickening and Exciting of the Naturall Heat. For the first, Excesse of Nourishment is hurtfull ; For it maketh the Childe Corpulent ; And Growing in Breadth, rather than in Height. And you may take an Experiment from Plants, which, if they spread much, are seldome tall. As for the Nature of the Nourishment ; First, it may not be too Drie ; And therefore Children in Dayrie Countries doe waxe more tall, than where they feed more upon Bread, and Flesh. There is also a received Tale ; That boyling of Daisie Roots in Milke (which it is certain are great Driers) will make Dogs little. But so much is true, that an Over-Drie Nourishment in Childhood putteth backe Stature. Secondly, the Nourishment must be of an Opening Nature ; For that Attenuateth the Juyce, and furthereth the Motion of the Spirits, upwards. Neither is it without cause, that Xenophon, in the Nouriture of the Persian Children, doth so much commend their Feeding upon Cardamon ; which (he saith) made them grow better, and bee of a more Active Habit. Cardamon is in Latine Nasturtium ; And with us water-Cresses ; Which, it is certaine, is an Herbe, that whilest it is young, is Friendly to Life. As for the Quickening of Naturall Heat, it must be done chiefly with Exercise ; And therefore (no doubt) much Going to Schoole, where they sit so much, hindreth the Growth of Children ; whereas Countrey-People, that goe not to Schoole, are commonly of better Stature. And againe Men must beware how they give Children, any thing that is Cold in Operation ; For even Long Sucking doth hinder both wit, and Stature. This hath beene tried, that a Whelpe, that hath beene fed with Nitre in Milke, hath become very little, but extreme lively : For the Spirit of Nitre is Cold. And though it be an Excellent Medicine, in Strength of yeares, for Prolongation of Life ; yet it is, in Children and young Creatures, an Enemy to Growth : And all for the same Reason ; For Heat is requisite to Growth : But after a Man is come to his Middle Age, Heat consumeth the Spirits ; which the Coldnesse of the Spirit of Nitre doth helpe to condense, and correct.

There bee two Great Families of Things ; You may terme them by severall Names ; Sulphureous and Mercureall, which are the Chymists Words : (For as for their Sal, which is their Third Principle,

Experiments  
in Confort  
touching Sul-  
phur and Mer-  
cury, two of  
Paracelsus  
Principles.



Principle, it is a Compound of the other two; *Inflammable*, and *Not Inflammable*; *Mature* and *Crude*; *Oily* and *Watry*. For wee see that in *Subterrancies* there are, as the *Fathers* of their *Tribes*, *Brimstone* and *Mercury*: In *Vegetables*, and *Living Creatures* there is *Water* and *Oile*: In the *Inferiour Order* of *Pneumaticalls* there is *Aire* and *Flame*: And in the *Superiour*, there is the *Body* of the *Starre*, and the *Pure Sky*. And these *Paires*, though they be unlike in the *Primitive Differences* of *Matter*, yet they seeme to have many *Consents*: For *Mercury* and *Sulphure* are principall *Materialls* of *Metalls*; *Water* and *Oyle*, are principall *Materialls* of *Vegetables*, and *Animals*; And seeme to differ but in *Maturation*, or *Concoction*: *Flame* (in *Vulgar Opinion*) is but *Aire Incensed*; And they both have *Quicknesse* of *Motion*, and *Facilitie* of *Cession*, much a like: And the *Interstellar Sky*, (though the *Opinion* be vaine, that the *Starre* is the *Denser Part* of his *Orbe*,) hath notwithstanding so much *Affinity* with the *Starre*, that there is a *Rotation* of that, as well as of the *Starre*. Therefore, it is one of the greatest *Magnalia Naturæ*, to turne *Water* or *Watry Iuyce* into *Oile* or *Oily Iuyce*: Greater in *Nature*, than to turne *Silver*, or *Quick-silver*, into *Gold*.

The *Instances* we have, wherein *Crude* and *Watry Substance* turneth into *Fat* and *Oily*, are of foure kindes. First in the *Mixture* of *Earth* and *Water*; which mingled by the help of the *Sunne*, gather a *Nitrous Fatnesse*, more than either of them have severally; As we see, in that they put forth *Plants*, which need both *Iuyces*.

355

The *Second* is in the *Assimilation* of *Nourishment*, made in the *Bodies* of *Plants*, and *Living Creatures*; Whereof *Plants* turne the *Juyce* of meere *Water* and *Earth*, into a great deal of *Oily Matter*: *Living Creatures*, though much of their *Fat*, and *Flesh*, are out of *Oily Aliments*, (as *Meat*, and *Bread*,) yet they *Assimilate* also in a *Measure* their *Drink* of *Water*, &c. But these two *Wayes* of *Version* of *Water* into *Oyle*, (namely by *Mixture*, and by *Assimilation*) are by many *Passages*, and *Perculations*, and by long *Continuance* of soft *Heats*, and by *Circuits* of *Time*.

356

The *third* is in the *Inception* of *Putrefaction*; As in *Water Corrupted*, And the *Mothers* of *Waters Distilled*; Both which have a kinde of *Fainesse*, or *Oyle*.

357

The *Fourth* is in the *Dulcoration* of some *Metalls*; As *Saccharum Saturni*, &c.

358

The *Intension* of *Version* of *Water* into a more *Oily Substance*, is by *Digestion*; For *Oile* is almost *Nothing* else but *Water Digested*; And this *Digestion* is principally by *Heat*; Which *Heat* must be either *Outward*, or *Inward*: Again, it may be by *Provocation*, or *Excitation*; Which is caused by the *Mingling* of *Bodies* already *Oily*, or *Digested*; For they will somewhat *Communicate* their *Nature* with the rest. *Digestion* also is strongly effected by direct *Assimilation*, of *Bodies Crude* into *Bodies Digested*; As in *Plants*, and *Living Creatures*, whose *Nourishment* is farre more *Crude* than their *Bodies*:

359



dies: But this *Disgestion* is by a great *Compassse*, as hath beene said. As for the more full Handling of these two Principles, whereof this is but a Taste; (the Enquiry of which is one of the Profoundest Enquiries of Nature,) We leave it to the *Title of Version of Bodies*; And likewise to the *Title of the First Congregations of Matter*; Which like a Generall Assembly of Estates, doth give Law to all *Bodies*.

Experiment  
Solitary tou-  
ching *Chamele-*  
*ons*.

360

**A** *Chameleon* is a Creature about the Bignesse of an Ordinary *Lizard*: His Head unproportionably bigge; His eyes great: He mooveth his Head without the writhing of his Necke, (which is inflexible,) as a *Hogge* doth: His Backe crooked; His Skinne spotted with little Tumours, lesse Eminent nearer the Belly; His Taile slender, and long: On each Foot he hath five Fingers; three on the Outside, and two on the Inside; His Tongue of a marvellous Length in respect of his Body, and hollow at the end; which he will launch out to prey upon *Flies*. Of Colour Green, and of a dusky Yellow, brighter and whiter towards the Belly; Yet spotted with Blew, White, and Red. If he be laid upon Green, the Greene predominateth; If upon Yellow, the Yellow; Not so if he be laid upon Blew, or Red, or White; Onely the Greene Spots receive a more Orient Lustre; Laid upon Blacke, hee looketh all Blacke, though not without a Mixture of Greene. He feedeth not onely upon Aire, (though that be his principall Sustenance;) For sometimes he taketh *Flies*, as was said; Yet some that have kept *Chameleons* a whole yeare together, could never perceiue that ever they fed upon any Thing else but Aire; And might observe their Bellies to swell after they had exhausted the Aire, and closed their Jawes; Which they open commonly against the Rayes of the Sunne. They have a foolish Tradition in *Magicke*, that if a *Chameleon* be burnt upon the Top of an House, it will raise a Tempest; Supposing (according to their vain Dreams of *Sympathies*) because he nourisheth with Aire, his Body should have great vertue to make Impression upon the Aire.

Experiment  
Solitary tou-  
ching *Subter-*  
*rany Fires*.

361

**I**T is reported by one of the *Ancients*, that in Part of *Media*, there are *Eruptions* of *Flames* out of *Plaines*; And that those *Flames* are cleare, and cast not forth such Smoake, and Ashes, and Pummeice, as *Mountaine Flames* doe. The Reason (no doubt) is, because the *Flame* is not pent, as it is in *Mountains*, and *Earthquakes* which cast *Flame*. There be also some *Blinde Fires*, under *Stone*, which flame not out, but *Oile* being powred upon them, they flame out. The Cause whereof is, for that it seemeth, the *Fire* is so choaked, as not able to remove the *Stone*, it is *Heat*, rather than *Flame*; Which nevertheless is sufficient to Enflame the *Oile*.

Experiment  
Solitary tou-  
ching *Nitre*.

362

**I**T is reported, that in some *Lakes*, the *Water* is so *Nitrous*, as if Foule Cloaths be put into it, it scoureth them of it selfe: And if they stay any whit long, they moulder away. And the scouring Vertue of *Nitre* is the more to be noted, because it is a *Body Cold*; And we see *Warne Water* scoureth better than *Cold*. But the Cause is, for that it hath a Subrill Spirit, which severeth and divideth any thing that is foule, and Viscous, and sticketh upon a Body.

Experiment  
Solitary tou-  
ching *Congea-*  
*ling of Aire*.

363

**T**Ake a *Bladder*, the greatest you can get; Fill it full of *Winde*, and tye it about the Neck with a Silke thred waxed; And upon that likewise Wax very close; So that when the Neck of the *Bladder* drieth, no *Aire* may possibly get in, nor out. Then bury it three or foure foot under the *Earth*, in a *Fault*, or in a *Conservatory of Snow*, the *Snow* being made hollow about the *Bladder*;



*Bladder*; And after some Fortnights distance, see whether the *Bladder* bee shrunk: For if it bee, then it is plaine, that the *Coldnesse* of the *Earth* or *Snow*, hath Condensed the *Aire*, and brought it a Degree nearer to *Water*: Which is an *Experiment* of great Consequence.

**I**T is a Report of some good credit, that in *Deepe Caves*, there are *Pen-sile Chrysell*, and *Degrees of Chrysell* that drop from above; And in some other, (though more rarely) that rise from below. Which though it bee chiefly the Worke of Cold, yet it may be, that *Water*, that passeth thorow the *Earth*, gathereth a Nature more clammy, and fitter to Congeale, and becomes Solide, than *Water* of it selfe. Therefore Triall would bee made, to lay a Heape of *Earth*, in great Frosts, upon a Hollow Vessell, putting a Canvase betweene, that it falleth not in: And poure *Water* upon it, in such Quantity as will be sure to soake thorow; And see whether it will not make an harder Ice in the bottome of the Vessell, and lesse apt to dissolve, than ordinarily. I suppose also, that if you make the *Earth* narrower at the bottome, than at the Top, in fashion of a Sugar Loafe Reversed, it will help the Experiment. For it will make the Ice, where it Issueth, lesse in Bulk; And evermore Smalnesse of Quantity is a Helpe to *Version*.

Experiment  
Solitary tou-  
ching Congea-  
ling of *Water*  
into *Chrysell*.

364

**T**Ake *Damaske Roses*, and pull them; Then drie them upon the Top of of an House, upon a Lead or Tarras, in the Hot Sunne, in a cleare day, between the Houres (onely) of twelve and two; or thereabouts. Then put them into a Sweet Drie Earthen Bottle, or a Glasse with narrow Mouthes, stuffing them close together, but without Bruising: Stop the Bottle, or Glasse, close, and these *Roses* will retaine, not onely their Smell Perfect, but their Colour fresh, for a yeare at least. Note, that Nothing doth so much destroy any Plant, or other body, either by *Putrefaction*, or *Arefaction*, as the *Adventitious Moisture*, which hangeth loose in the Body, if it be not drawne out. For it betrayeth and tolleth forth the *Innate* and *Radicall Moisture*, along with it, when it self goeth forth. And therefore in *Living Creatures*, Moderate Sweat doth preserve the Juyce of the Body. Note that these *Roses*, when you take them from the *Drying*, have little or no Smell; So that the Smell is a Second Smell, that issueth out of the Flower afterwards.

Experiment  
Solitary tou-  
ching Preser-  
ving of *Rose*  
leaves both in  
Colour and  
Smell.

365

**T**He Continuance of Flame, according unto the diversity of the Body Enflamed, and other Circumstances, is worthy the Enquiry; Chiefly, for that though Flame be (almost) of a Momentany Lasting, yet it receiveth the More, and the Lesse: we will first therefore speake (at large) of Bodies Enflamed, wholly, and Immediately, without any *Wicke* to helpe the *Inflammation*. A Spoonfull of Spirit of wine, a little heated, was taken, and it burnt as long as came to 116. Pulses. The same Quantity of Spirit of wine, Mixed with the Sixth Part of a Spoonfull of Nitre burnt but to the space of 94. Pulses. Mixed with the like Quantity of Bay-salt, 83. Pulses. Mixed with the like Quantity of Gunpowder, which dissolved into a Blacke water, 110 Pulses. A Cube, or Pellet of Yellow Wax, was taken, as much as halfe the Spirit of wine, and set in the Middest, and it burnt onely to the space of 87. Pulses. Mixed with the Sixth Part of a spoonfull of Milke, it burnt to the space of 100. Pulses; And the Milke was crudled. Mixed with the Sixth Part of a spoonfull of water, it burnt to the space of 86. Pulses; With an Equall Quantity of water, onely to the space of 4. Pulses. A small Pebble was laid in the Middest, and the Spirit of wine burnt to the space of 94. Pulses.

Experiments  
in Consort  
touching the  
Continuance of  
Flame.

366



Pulses. A Peece of *wood*, of the Bignesse of an Arrow, and about a Fingers length, was set up in the Middest, and the *Spirit of wine* burnt to the space of 94. Pulses. So that the *Spirit of wine Simple*, endured the longest; And the *Spirit of wine* with the *Bay-salt*, and the Equall Quantity of *water*, were the shortest.

367

Consider well, whether the more speedy Going forth of the flame, be caused, by the Greater Vigour of the Flame in Burning; Or by the Resistance of the Body mixed, and the Aversion thereof to take Flame: Which will appeare by the Quantity of the *Spirit of wine*, that remaineth after the Going out of the Flame. And it seemeth clearly to bee the latter; For that the Mixture of Things least apt to burne, is the Speediest in going out. And note, by the way, that *Spirit of wine* burned, till it goe out of it self, will burne no more; And tasteth nothing so hot in the Mouth as it did; No nor yet sowre, (as if it were a degree towards *Vinegar*,) which *Burnt wine* doth; but flat and dead.

368

Note, that in the Experiment of *Wax* aforesaid, the *Wax* dissolved in the burning, and yet did not incorporate it self, with the *Spirit of wine*, to produce one Flame; but wheresoever the *Wax* floated, the Flame forsooke it, till at last it spread all over, and put the Flame quite out.

369

The Experiments of the Mixtures of the *Spirit of wine* enflamed, are Things of discovery, and not of Use: But now we will speake of the Continuance of Flames, such as are used for Candles, Lamps, or Tapers; consisting of Inflammable Matters, and of a Wieke that provoketh Inflammation. And this importeth not onely Discovery, but also Use and Profit; For it is a great Saving in all such Lights, if they can be made as faire and right as others, and yet last longer. *Waxe Pure* made into a Candle, and *Waxe Mixed* severally into Candle-stuffe, with the Particulars that follow; (viz. *water*, *Aqua-vita*, *Milke*, *Bay-salt*, *Oyle*, *Butter*, *Nitre*, *Brimstone*, *Saw-dust*,) Every of these bearing a Sixth Part to the *wax*; And every of these Candles Mixed, being of the same Weight and Wieke, with the *Wax Pure*, proved thus in the Burning, and Lasting. The Swiftest in Consuming was that with *Saw-dust*; Which first burned faire till some part of the Candle was consumed, and the Dust gathered about the Snafte; But then it made the Snafte bigge, and long, and to burne duskyishly, and the Candle wasted in halfe the time of the *Wax Pure*. The next in Swiftnesse, were the *Oyle*, and *Butter*, which consumed, by a Fifth part, swifter than the *Pure Wax*. Then followed in Swiftnesse the *Cleare Wax* it selfe. Then the *Bay-Salt*, which lasted about an Eighth part longer than the *Cleare Wax*. Then followed the *Aqua-vita*, which lasted about a Fifth part longer than the *Cleare Wax*. Then followed the *Milke*, and *water*, with little difference from the *Aqua-vita*, but the *water* slowest. And in these foure last, the Wieke would spit forth little Sparks. For the *Nitre*, it would not hold lighted above some Twelve Pulses: But all the while it would spit out Portions of Flame, which afterwards would go out into a vapour. For the *Brimstone*, it would hold lighted, much about the same with the *Nitre*; But then after a little while, it would harden and cake about the Snafte; So that the Mixture of *Bay-Salt* with *Wax*, will winne an Eighth part of the time of lasting, and the *water* a Fifth.

370

After the Severall Materialls were tried, Triall was likewise made of severall Wiekes; As of Ordinary Cotton; Sowing Thred, *Rush*; *Silke*; *Straw*; and *Wood*. The *Silke*, *Straw*, and *Wood*, would flame a little, till they came to the *Wax*, and then goe out: of the Other Three, the Thred consumed faster than the Cotton, by a Sixth part of Time: The Cotton next: Then the *Rush* consumed



burned slower than the *Cotton*, by at least a third part of time. For the Bignesse of the *Flame*, the *Cotton*, and *Thred*, cast a *Flame* much alike; and the *Rush* much lesse, and dimmer. *Quere*, whether *Wood*, and *Wickes* both, as in *Torches*, consume faster, than the *Wickes Simple*?

We have spoken of the Severall *Materialls*, and the Severall *Wickes*: But to the *lasting* of the *Flame*, it importeth also; Not only what the *Materiall* is, but in the same *Materiall*, whether it be Hard, Soft, Old, New &c. Good *Housewives*, to make their *Candles* burne the longer, use to lay them (one by one) in *Bran*, or *Flower*, which make them harder, and so they Consume the slower: Infomuch, as by this meanes, they will out-last other *Candles*, of the same stuffe, almost Halfe in Halfe. For *Bran* and *Flower* have a Vertue to Harden: So that both Age, and lying in the *Bran*, doth help to the *Lasting*. And wee see that *wax Candles* last longer than *Tallow Candles*, because *wax* is more firme, and hard.

The *Lasting* of *Flame* also dependeth upon the easie *Drawing* of the *Nourishment*; As we see in the *Court* of *England*, there is a Service which they call *All-night*; which is (as it were) a great Cake of wax, with the *Wicke* in the Middest; whereby it commeth to passe, that the *Wicke* fetcheth the *Nourishment* further off. We see also that *Lamps* last longer, because the vessell is farre broader, than the Breadth of a *Taper*, or *Candle*.

Take a *Turreted Lampe* of *Tinne*, made in the forme of a *Squire*; The Heighth of the *Turret* being thrice as much, as the length of the lower part, whereupon the *Lampe* standeth: Make only one Hole in it, at the End of the *Returne* furthest from the *Turret*. Reverse it, and fill it full of *Oile*, by that Hole; And then set it upright againe; And put a *Wicke* in at the Hole; And lighten it: You shall finde, that it will burne slow, and a long time. Which is caused, (as was said last before,) for that the *Flame* fetcheth the *Nourishment* a farre off. You shall finde also, that as the *Oile* wasteth, and descendeth, so the Top of the *Turret*, by little and little, filleth with *Aire*; which is caused by the Rarefaction of the *oile* by the Heat. It were worthy the Observation, to make a Hole, in the Top of the *Turret*, and to trie, when the *Oile* is almost consumed, whether the *Aire* made of the *Oile*, if you put to it a *Flame* of a *Candle*, in the letting of it forth, will Enflame. It were good also to have the *Lampe* made, not of *Tinne*, but of *Glasse*, that you may see how the Vapour, or *Aire* gathereth, by degrees, in the Top.

A fourth Point, that importeth the *lasting* of the *Flame*, is the Closenesse of the *Aire*, wherein the *Flame* burneth. Wee see, that if *wind* bloweth upon a *Candle*, it wasteth apace. We see also, it lasteth longer in a *Laniborne*, than at large. And there are Traditions of *Lamps*, and *Candles*, that have burnt a very long time, in *Caves*, and *Tombs*.

A Fifth Point, that importeth the *Lasting* of the *Flame*, is the Nature of the *Aire*, where the *Flame* burneth; whether it be Hot or Cold; Moist or Drie. The *Aire*, if it be very Cold, irritateth the *Flame*, and maketh it burne more fiercely; (As Fire scorseth in Frostie weather;) And so furthereth the Consumption. The *Aire* once heated, (I conceive) maketh the *Flame* burne more mildly, and so helpeth the Continuance. The *Aire*, if it be Drie, is indifferent: The *Aire*, if it be Moist, doth in a Degree quench the *Flame*: (As wee see *Lights* will go out in the *Damps* of *Mines*;) And howsoever maketh it burne more dully: And so helpeth the Continuance.

**B**rialls in Earth serue for Preservation; And for Condensation; And for Induration of Bodies. And if you intend Condensation, or Induration, you may

371

372

373

374

375

Experimenters  
in Consort,  
touching Buri-  
alls or Infusions  
of diuers Be-  
dies in Earth.

376



may bury the *Bodies* so, as *Earth* may touch them: As if you will make *Artificiall Porcellane*, &c. And the like you may do for *Conservation*, if the *Bodies* be Hard, and Solid; As *Clay*, *Wood*, &c. But if you intend *Preservation* of *Bodies*, more Soft and Tender, then you must doe one of these two: Either you must put them in *Cases*, whereby they may not touch the *Earth*; Or else you must vault the *Earth*, whereby it may hang over them, and not touch them; For if the *Earth* touch them, it will doe more hurt, by the Moisture, causing them to putrifie, than good by the virtuall Cold, to conserve them; Except the *Earth* be very Drie, and Sandie.

377 An *Orenge*, *Limon*, and *Apple*, wrapt in a Linnen Cloth, being buried for a Fortnights Space, foure Foot deepe within the *Earth*, though it were in a Moist Place, and a Rainie Time, yet came forth, no wayes mouldie, or Rotten, but were become a little harder than they were; Otherwise fresh in their Colour; But their Juyce somewhat flatted. But with the *Buriall* of a Fortnight more they became Putrified.

378 A *Bottle* of *Beere*, buried in like manner, as before, became more lively, better tasted, and Clearer, than it was. And a *Bottle* of *Wine* in like manner. A *Bottle* of *Vinegar*, so buried, came forth more lively, and more Odoriferous, smelling almost like a Violet. And after the whole Moneths *Buriall*, all the Three came forth, as fresh and lively, if not better, than before.

379 It were a profitable *Experiment*, to preserve *Orenge*s, *Limon*s, and *Pomgranates*, till Summer; For then their Price will be mightily increased. This may be done, if you put them in a Pot or Vessell, well covered, that the Moisture of the *Earth* come not at them; Or else by putting them in a *Conservatory* of *Snow*. And generally, whosoever will make *Experiments* of Cold, let him be provided of three Things; A *Conservatory* of *Snow*; A good large *Vault*, twenty foot at least under the Ground; And a *Deepe well*.

380 There hath beene a Tradition, that *Pearle*, and *Corall*, and *Turchois-Stone*, that have lost their Colours, may be recovered by *Burying* in the *Earth*: Which is a thing of great profit, if it would sort: But upon *Triall* of Sixe Weekes *Buriall*, there followed no Effect. It were good to trie it, in a *Deep well*; Or in a *Conservatory* of *Snow*, where the Cold may be more *Constrigent*; And so make the *Body* more united, and thereby more *Resplendent*.

Experiment  
Solitary touch-  
ing the *Affectis*  
in *Mens Bodies*  
from *Severall*  
*Winds*.

381

**M**ens *Bodies* are heavier, and lesse disposed to Motion, when *Southern Winds* blow, than when *Northerne*. The Cause is, for that when the *Southerne Winds* blow, the Humours doe (in some Degree) melt, and waxe fluide, and so flow into the Parts; As it is seen in *Wood*, and other *Bodies*; which, when the *Southerne Winds* blow, doe swell. Besides, the Motion and Activity of the *Body* consisteth chiefly in the *Sinewes*, which, when the *Southerne Wind* bloweth, are more relax.

Experiment  
Solitary touch-  
ing *Winter* and  
*Summer Sick-*  
*nesses*.

382

**I**t is commonly seen, that more are *Sick* in the *Summer*, and more *Dye* in the *Winter*; Except it be in *Pestilent Diseases*, which commonly raigne in *Summer*, or *Autumne*. The Reason is, because *Diseases* are bred (indeed) chiefly by *Heat*; But then they are Cured most by *Sweat*, and *Purge*, which in the *Summer* commeth on, or is provoked, more Easily: As for *Pestilent Diseases*, the Reason why most *Dye* of them in *Summer*, is because they are bred most in the *Summer*; For otherwise those that are touched are in most danger in the *Winter*.

The



**T**He Generall Opinion is, that *Yeares Hot* and *Moist*, are most *Pestilent*; Upon the Superficiall Ground, that *Heat* and *Moisture* cause *Putrefaction*. In *England* it is found not true; For, many times, there have beene great *Plagues* in *Drie Yeares*. Whereof the Cause may be, for that *Drought* in the Bodies of *Islanders*, habituate to *Moist Aires*, doth Exasperate the *Humours*, and maketh them more apt to *Putrifie*, or *Enflame*: Besides, it tainteth the *Waters* (commonly,) and maketh them lesse wholesome. And againe in *Barbary*, the *Plagues* breake up in the *Summer-moneths*; when the *Weather* is *Hot* and *Dry*.

**M**Any *Diseases*, (both *Epidemicall*, and others,) breake forth at *Particular times*. And the Cause is falsly imputed to the *Constitution* of the *Aire*, at that time, when they breake forth, or *raigne*; whereas it proceedeth (indeed) from a *Precedent Sequence*, and *Series* of the *Seasons* of the *Yeare*: And therefore *Hippocrates*, in his *Prognosticks*, doth make good *Observations*, of the *Diseases*, that ensue upon the *Nature*, of the *Precedent foure Seasons* of the *Yeare*.

**T**Riall hath beene made, with *Earthen Bottles* well stopp'd, hang'd in a *Well* of *Twenty Fathome deepe*, at the least; And some of the *Bottles* have beene let downe into the *Water*, some others have hang'd above, within about a fathome of the *Water*; And the *Liquours* so tried have beene, *Beere*, (not *New*, but *Ready* for drinking,) and *Wine*, and *Milke*. The *Prooffe* hath beene, that both the *Beere*, and the *Wine*, (as well within *Water*, as above,) have not beene palled or dead'd at all; But as good, or somewhat better, than *Bottles* of the same *Drinkes*, and *Staleness*, kept in a *Celler*. But those which did hang above *Water*, were apparently the best; And that *Beere* did flower a little; whereas that under *Water* did not, though it were *Fresh*. The *Milke* sower'd, and began to *Putrifie*. Neverthelesse it is true, that there is a *Village* neare *Blois*, where in *Deepe Caves* they doe thicken *Milke*; In such sort, that it becommeth very pleasant; Which was some Cause of this *Triall* of *Hanging Milke* in the *Well*: But our *prooffe* was naught; Neither doe I know, whether that *Milke* in those *Caves*, bee first boyled. It were good therefore to trie it with *Milke* *Sodden*, and with *Creame*; For that *Milke* of it selfe is such a *Compound Body*, of *Creame*, *Curds*, and *Whey*, as it is easily *Turned*, and *Dissolved*. It were good also to trie the *Beere*, when it is in *Wort*, that it may bee seene, whether the *Hanging* in the *Well*, will *Accelerate* the *Ripening* and *Clarifying* of it.

**D**Ivers, we see, doe *Stut*. The Cause may bee, (in most,) the *Refrigeration* of the *Tongue*; Whereby it is lesse apt to move. And therefore wee see, that *Naturalls* doe generally *Stut*: And wee see that in those that *Stut*, if they drinke *Wine* moderately, they *Stut* lesse, because it heateth: And so we see, that they that *Stut*, doe *Stut* more in the first offer to speake, than in *Continuance*; Because the *Tongue* is, by *Motion*, somewhat heated. In some also, it may be, (though rarely,) the *Driness* of the *Tongue*; which likewise maketh it lesse apt to move, as well as *Cold*; For it is an *Affect* that it cometh to some *wise* and *Great Men*; As it did unto *Moses*, who was *Lingua Præpedita*; And many *Stutters* (wee finde) are very *Cholericke Men*; *Choler* Enducing a *Driness* in the *Tongue*.

Experiment  
Solitary tou-  
ching *Pestilen-  
tiall Seasons*.

383

Experiment  
Solitary tou-  
ching an Er-  
ror received  
about *Epidē-  
demicall Disea-  
ses*.

384

Experiment  
Solitary tou-  
ching the  
*Alteration* or  
*Preservation*  
of *Liquours* in  
*Wells*, or *deepe  
Vaults*.

385

Experiment  
Solitary, tou-  
ching *Stutting*

386



Experiments  
in Confort  
touching  
Smells.

387

**S** Smells, and other Odours, are Sweeter in the Aire, at some Distance, than neare the Nose; As hath beene partly touched heretofore. The Cause is double: First the finer Mixture, or Incorporation of the Smell: For wee see that in Sounds likewise, they are Sweetest, when we cannot heare every Part by it selfe. The other Reason is, for that all Sweet Smells have joyned with them, some Earthy or Crude Odours; And at some distance the Sweet, which is the more Spirituall, is perceived; And the Earthy reacheth not so farre.

388

Sweet Smells are most forcible, in drie Substances, when they are Broken; And so likewise in Oranges, or Limons, the Nipping of their Rinde, giveth out their Smell more: And generally, when Bodies are Moved or Stirred, though not Broken, they Smell more; As a Sweet-Bagge waved. The Cause is double: The one, for that there is a Greater Emission of the Spirit, when Way is made: And this holdeth in the Breaking, Nipping, or Crushing; It holdeth also, (in some degree) in the Moving: But in this last, there is a Concurrence of the Second Cause; Which is the Impulsion of the Aire, that bringeth the Sent faster upon us.

389

The daintiest Smells of Flowers, are out of those Plants, whose Leaves smell not; As Violets, Roses, Wall-flowers, Gilly-flowers, Pincks, Wood-bines, Vine-flowers, Apple-Bloomes, Lime-Tree Bloomes, Beane-Bloomes, &c. The Cause is, for that where there is Heat and strength enough in the Plant, to make the Leaves Odorate, there the Smell of the Flower is rather Evanide and Weaker, than that of the Leaves; As it is in Rose-Mary-Flowers, Lavender-Flowers, and Sweet-Briar-Roses. But where there is lesse Heat, there the Spirit of the Plant, is digested and refined, and severed from the Grosser Juycce, in the Efflorescence, and not before.

390

Most Odours smell best, Broken or Crushed, as hath beene said; But Flowers Pressed or Beaten, doe leese the Freshnesse and Sweetnesse of their Odour. The Cause is, for that when they are Crushed, the Grosser and more Earthy Spirit commeth out with the Finer, and troubleth it; Whereas in stronger Odours there are no such Degrees of the Issue of the Smell.

Experiments  
in Confort,  
touching the  
Goodnesse and  
Choyce of  
Water.

391

**I**T is a Thing of very good Use, to Discover the Goodnesse of Waters. The Taste, to those that Drink Water onely, doth somewhat: But other Experiments are more sure. First, try Waters by Weight; Wherein you may finde some difference, though not much: And the Lighter you may account the Better.

392

Secondly, try them by Boyling upon an Equall Fire: And that which consumeth away fastest, you may account the Best.

393

Thirdly, try them in Severall Bottles, or Open Vessels, Matches in every Thing else, and see which of them Last Longest, without Stench, or Corruption. And that which holdeth Unputrified longest, you may likewise account the Best.

394

Fourthly, try them by Making Drinckes Stronger, or Smaller, with the same Quantity of Maile; And you may conclude, that that Water, which maketh the Stronger Drinke, is the more Concocted, and Nourishing; though perhaps it be not so good for Medicinall use. And such Water (commonly) is the Water of Large and Navigable Rivers: And likewise in Large and Cleane Ponds of Standing Water: For upon both them, the Sunne hath more power than upon Fountaines, or Small Rivers. And I conceive that Chalke-Water is next them the best, for going furthest in Drinke: For that also helpeth Concoction; So it be out of a Deepe Well; For then it Cureth the



the Rawnesse of the *Water*; But *Chalkie Water*, towards the Top of the Earth, is too fretting; As it appeareth in Laundry of Cloaths, which weare out apace, if you use such *Waters*.

Fifthly, the Houfwives doe finde a Difference in *Waters*, for the *Bearing* or *Not Bearing* of *Soape*: And it is likely that the more *Fat Water* will beare *Soape* best; For the *Hungry water* doth kill the Unctuous Nature of the *Soape*.

Sixthly, you may make a Judgement of *Waters*, according to the *Place*, whence they Spring, or Come: The *Raine-water* is, by the *Physitians* esteemed the Finest, and the best; But yet it is said to putrefie soonest; which is likely, because of the Fineness of the Spirit: And in *Conservatories* of *Raine-water*, (such as they have in *Venice*, &c.) they are found not so Choice *Waters*; The worse, (perhaps,) because they are Covered aloft, and kept from the Sunne. *Snow-water* is held unwholesome; In so much as the People, that dwell at the Foot of the *Snow-Mountaines*, or otherwise upon the Ascent, (especially the Women,) by drinking of *Snow-water*, have great Bagges hanging under their Throats. *Well-water*, except it be upon *Chalke*, or a very plentiful Spring, maketh Meat Red; which is an ill Signe. *Springs* on the Tops of *High-Hills* are the best: For both they seeme to have a Lightnesse, and Appetite of Mounting; And besides they are most pure and unmingled; And againe, are more Percolated thorow a great space of Earth. For *Waters* in *Valleyes*, joyne in effect under Ground with all *Waters* of the same Levell; Whereas *Springs* on the Tops of *Hills*, passe thorow a great deale of Pure *Earth*, with lesse Mixture of other *Waters*.

Seventhly, Judgement may bee made of *Waters* by the Soyle whereupon the *Water* runneth; As *Pebble* is the Cleanest, and best tasted; And next to that *Clay-water*; And Thirdly, *Water* upon *Chalke*; Fourthly, that upon *Sand*; And Worst of all upon *Mudde*. Neither may you trust *Waters* that Taste Sweet; For they are commonly found in Rising Grounds of great Cities; which must needs take in a great deale of Filth.

IN *Peru*, and divers Parts of the *West-Indies*, though under the *Line*, the Heats are not so Intolerable, as they be in *Barbary*, and the Skirts of the *Torrid Zone*. The Causes are, First, the Great *Brizes*, which the Motion of the Aire in great Circles, (such as are under the Girdle of the World,) produceth; Which doe refrigerate; And therefore in those Parts Noone is nothing so hot, when the *Brizes* are great, as about Nine or Ten of the Clocke in the Fore-Noone. Another Cause is, for that the Length of the Night, and the Dewes thereof, doe compensate the Heat of the Day. A third Cause is the Stay of the Sunne; Not in Respect of Day and Night, (for that wee spake of before,) but in Respect of the Season; For under the *Line*, the Sunne crosseth the *Line*, and maketh two Summers, and two Winters; But in the Skirts of the *Torrid Zone*, it doubleth, and goeth back againe, and so maketh one Long Summer.

THE Heat of the Sunne maketh Men Blacke in some Countries, as in *Ethiopia*, and *Ginny*, &c. Fire doth it not, as wee see in *Glasse-Men*, that are continually about the Fire. The Reason may bee, because Fire doth lick up the Spirits, and Bloud of the Body, so as they Exhale; So that it ever maketh Men looke Pale and Sallow; But the Sunne, which is a Gentler Heat, doth but draw the Bloud to the Outward Parts; And rather Concocteth it, than Soaketh it: And therefore wee see that all

395

396

397

Experiment  
Solitary touching the  
Temperate  
Heat under  
the Equino-  
ctiall.

398

Experiment  
Solitary touching the Co-  
loration of  
Blacke and  
Tawney  
Moors.

399



*Aethiopes* are Fleſhy, and Plumpe, and have great Lips; All which betoken *Moifture* retained, and not drawne out. We ſee alſo, that the *Negroes* are bred in Countries that have plenty of *Water*, by *Rivers*, or otherwiſe: For *Meroë*, which was the *Metropolis* of *Aethiopia*, was upon a great Lake: And *Congo*, where the *Negroes* are, is full of *Rivers*. And the *Confines* of the River *Niger*, where the *Negroes* alſo are, are well watered: And the Region about *Capo Verde*, is likewiſe *Moift*, in ſo much as it is peſtilent through *Moifture*: But the Countries of the *Abyſſenes*, and *Barbary*, and *Peru*, where they are *Tawney*, and *Olivaſter*, and *Pale*, are generally more *Sandy*, and *Dry*. As for the *Aethiopes*, as they are *Plumpe*, and *Fleſhy*; So (it may be) they are *Sanguine*, and *ruddy Coloured*, if their black *Skinne* would ſuffer it to be ſcene.

Experiment  
Solitary touch-  
ing Motion  
after the In-  
ſtant of Death.

400

SOME *Creatures* doe move a good while after their *Head* is off; As *Birds*; Some a very little time; As *Men*, and all *beaſts*; Some move, though cut in ſeverall *Pieces*; As *Snakes*, *Eeles*, *Wormes*, *Flies*, &c. *Fiſt* therefore it is certaine, that the *Immediate Cauſe* of *Death*, is the *Reſolution* or *Extinguiſhment* of the *Spirits*; And that the *Deſtruction* or *Corruption* of the *Organs*, is but the *Mediate Cauſe*. But ſome *Organs* are ſo peremptorily neceſſary, that the *Extinguiſhment* of the *Spirits* doth ſpeedily follow; But yet ſo, as there is an *Interim* of a *Small Time*. It is reported by one of the *Ancients*, of credit, that a *Sacrificed Beaſt* hath lowed, after the *Heart* hath beene ſevered; And it is a Report alſo of Credit, that the *Head* of a *Pigge* hath beene opened, and the *Braine* put into the *Palme* of a *Mans hand*, trembling, without breaking any part of it, or ſevering it from the *Marrow* of the *Back-bone*; During which time the *Pigge* hath beene, in all appearance, ſtarke dead, and without *Motion*; And after a *ſmall Time* the *Braine* hath beene replaced, and the *Skull* of the *Pigge* cloſed, and the *Pigge* hath a little after gone about. And certaine it is, that an *Eye* upon *Revenge* hath been thruſt forth, ſo as it hanged a pretty diſtance by the *Viſuall Nerve*; And during that time the *Eye* hath beene without any *Power of Sight*; And yet after (being replaced) recovered *Sight*. Now the *Spirits* are chiefly in the *Head*, and *Cells* of the *Braine*, which in *Men*, and *Beaſts* are *Large*; And therefore, when the *Head* is off, they move little or nothing. But *Birds* have *ſmall Heads*, and therefore the *Spirits* are a little more diſperſed in the *Sinewes*, whereby *Motion* remaineth in them a little longer; In ſo much as it is Extant in *Story*, that an *Emperour* of *Rome*, to ſhew the *Certainty* of his *Hand*, did Shoot a great *Forked Arrow* at an *Eſtrich*, as ſhe ran ſwiftly upon the *Stage*, and ſtrook off her *Head*; And yet ſhe continued the *Race*, a little way, with the *Head* off. As for *Wormes*, and *Flies*, and *Eeles*, the *Spirits* are diffuſed almoſt all over; And therefore they move in their *Severall Pieces*.

NATU-





# NATVRALL HISTORIE.

## V. Century.



WE will now enquire of *Plants* or *Vegetables*: And wee shall doe it with diligence. They are the principall Part of the *Third Dayes Worke*. They are the first *Producat*, which is the Word of *Animation*: For the other Words are but the Words of *Effence*; And they are of excellent and generall Use, for Food, Medicine, and a Number of Mechanicall Arts.

There were sown in a *Bed*, *Turnip-Seed*, *Radish-Seed*, *Wheat*, *Cucumber-Seed*, and *Pease*. The *Bed* wee call a *Hot-Bed*, and the Manner of it is this. There was taken *Horse-dung*, old, and well rotted; This was laid upon a Banke, halfe a foot high, and supported round about with Planks; And upon the Top was cast Sifted Earth, some two Fingers deepe; And then the *Seed* sprinkled upon it, having been steeped all night in *Water* Mixed with *Com-dung*. The *Turnip-Seed*, and the *Wheat* came up halfe an Inch above Ground, within two dayes after, without any Watring. The Rest the third day. The *Experiment* was made in *October*; And (it may be) in the *Spring*, the *Accelerating* would have been the speedier. This is a Noble *Experiment*; For without this helpe, they would have beene foure times as long in comming up. But there doth not occurre to me, at this present, any use thereof, for profit; Except it should be for Sowing of *Pease*, which have their price very much increased, by the early Comming. It may be tried also with *Cherries*, *Strawberries*, and other Fruit, which are dearest, when they come early.

There was *Wheat*, steeped in *Water* mixed with *Com-dung*; Other in *Water* mixed with *Horse-Dung*; Other in *Water* mixed with *Pigeon-Dung*; Other in *Urine of Man*; Other in *Water* mixed with *Chalke* powdred; Other in *Water* mixed with *Soot*; Other in *Water* mixed with *Asbes*; Other in *Wa-*

Experiment  
in Consort,  
touching the  
Acceleration of  
Germination.

401

402



ter mixed with *Bay-Salt*; Other in *Claret Wine*; Other in *Malmsey*; Other in *Spirit of Wine*. The Proportion of the Mixture was, a fourth Part of the Ingredients to the *Water*; Save that there was not of the *Salt* above an eighth Part. The *Vrine*, and *Wines*, and *Spirit of Wine*, were Simple without Mixture of *Water*. The Time of the Steeping was twelve houres. The Time of the Yeare *October*. There was also other *wheat* sown *unsteeped*, but watered twice a day with *Warmewater*. There was also other *wheat* sown *Simple* to compare it with the rest. The Event was; that those that were in the Mixture of *Dung*, and *Vrine*, and *Soot*, *Chalke*, *Ashes*, and *Salt*, came up within sixe dayes: And those that afterwards proved the Highest, Thickest, and most Lustie, were, first the *Vrine*; And then the *Dungs*; Next the *Chalke*; Next the *Soot*; Next the *Ashes*; Next the *Salt*; Next the *wheat Simple* of it selfe, *unsteeped*, and *unwatered*; Next the *Watered twice a day* with warme water; Next the *Claret Wine*. So that these three last were slower than the Ordinary *wheat* of it selfe; And this Culture did rather retard, than advance. As for those that were steeped in *Malmsey*, and *Spirit of Wine*, they came not up at all. This is a Rich Experiment for Profit; For the most of the Steepings are Cheape Things; And the goodnesse of the Crop is a great Matter of Gaine; If the Goodnesse of the Crop answer the Earlinesse of the Comming up: As it is like it will; Both being from the Vigour of the *Seed*; Which also partly appeared in the Former Experiments, as hath beene said. This Experiment would be tried in other *Grains*, *Seeds*, and *Kernells*: For it may be some Steeping will agree best with some *Seeds*. It would be tried also with *Roots* steeped as before, but for longer time. It would be tried also, in *Severall Seasons* of the Yeare, especially the *Spring*.

403

*Strawberries* watered now and then, (as once in three dayes,) with *Water*, wherein hath beene steeped *Sheepes-dung*, or *Pigeons-dung*, will prevent and come early. And it is like the same Effect would follow in other *Berries*, *Herbs*, *Flowers*, *Graines*, or *Trees*. And therefore it is an Experiment, though vulgar in *Strawberries*, yet not brought into use generally: For it is usuall to helpe the Ground with Mucke; And likewise to Recomfort it sometimes with Muck put to the Roots; But to water it with *Muck water*, which is like to be more Forcible, is not practised.

404

*Dung*, or *Chalke*, or *Bloud*, applied in Substance, (seasonably,) to the Roots of *Trees*, doth set them forwards. But to doe it unto *Herbs*, without Mixture of *Water* or *Earth*, it may be these helps are too Hot.

405

The former Meanes of Helping Germination, are either by the Goodnesse and Strength of the Nourishment; Or by the Comforting, and Exciting the Spirits in the Plant, to draw the Nourishment better. And of this latter kinde, concerning the Comforting of the Spirit of the Plant, are also the experiments that follow; Though they be not Applications to the Root, or Seed. The Planting of *Trees* warme upon a wall, against the South, or South-East Sunne, doth hasten their Comming on, and Ripening; And the South-East is found to be better than the South-West, though the South-West be the Hotter Coast. But the cause is chiefly, for that the Heat of the Morning succeedeth the Cold of the Night: and partly, because, (many times) the South-West Sunne is too Parching. So likewise the Planting of them upon the Back of a Chimney where a Fire is kept, doth hasten their Comming on, and Ripening: Nay more, the Drawing of the Boughes into the Inside of a Roome, where a Fire is continually kept, worketh the same Effect; which hath beene tried with *Grapes*; In so much as they will come a Moneth earlier, than the *Grapes* abroad.

Besides



Besides the two *Meanes* of *Accelerating Germination*, formerly described; That is to say, the *Mending* of the *Nourishment*; *Comforting* of the *Spirit* of the *Plant*; there is a *Third*; Which is the *Making way* for the *Easie Comming* to the *Nourishment*, and *Drawing* it. And therefore *Gentle Digging* and *Loosening* of the *Earth* about the *Roots* of *Trees*; And the *Removing Herbes* and *Flowers* into new *Earth*, once in two yeares, (which is the same thing; For the new *Earth* is ever looser,) doth greatly further the *Prospering*, and *Earlinesse* of *Plants*.

406

But the most admirable *Acceleration* by *Facilitating* the *Nourishment*, is that of *Water*. For a *Standard* of a *Damaske Rose* with the *Root* on, was set in a *Chamber*, where no *Fire* was, upright in an *Earthen Pan*, full of *Faire Water*, without any *Mixture*, halfe a foot under the *Water*, the *Standard* being more than two Foot high above the *Water*: Within the *Space* of ten dayes, the *Standard* did put forth a faire *Greene leafe*, and some other little *Buds*, which stood at a *stay*, without any *Shew* of decay or withering, more than seven *Dayes*. But afterwards that *Leafe* faded, but the young *Buds* did sprout on, which afterward opened into fair *Leaves*, in the space of three *Moneths*; And continued so a while after, till upon *Removall* we left the *Triall*. But note that the *Leaves* were somewhat paler, & lighter-colored, than the *Leaves* use to be abroad. Note that the first *Buds* were in the *End* of *October*; And it is likely that if it had beene in the *Spring* time, it would have put forth with greater strength, and (it may be) to have growne on to beare *Flowers*. By this *Meanes*, you may have, (as it seemeth,) *Roses* set in the midst of a *Poole*, being supported with some *stay*; Which is *Matter* of *Rarenesse* and *Pleasure*, though of small *Use*. This is the more strange, for that the like *Rose-standard* was put, at the same time, into *Water* mixed with *Horse-dung*, the *Horse-dung* about the fourth *Part* to the *Water*, and in foure *Moneths* space (while it was observed) put not forth any *Leafe*, though divers *Buds* at the first, as the other.

407

A *Dutch Flower*, that had a *Bulbous Root*, was likewise put, at the same time, all under *Water*, some two or three *Fingers* deep; And within seven dayes sprouted, and continued long after, further *Growing*. There were also put in, a *Beet-Root*, a *Borrage-Root*, and a *Raddish-Root*, which had all their *Leaves* cut almost close to the *Roots*; And within six weekes had faire *Leaves*; And so continued, till the end of *November*.

408

Note that if *Roots*, or *Pease*, or *Flowers*, may be *Accelerated* in their *Comming* and *Ripening*, there is a double *Profit*; The one in the high *Price* that those *Things* beare when they come early: The other in the *Swiftnesse* of their *Returnes*: For in some *Grounds* which are strong, you shall have a *Raddish*, &c. come in a *Moneth*; That in other *Grounds* will not come in two; And so make double *Returnes*.

409

*Wheat* also was put into the *Water*, and came not forth at all; So as it seemeth there must be some *Strength* and *Bulke* in the *Body*, put into the *Water*, as it is in *Roots*; For *Graines*, or *Seeds*, the *Cold* of the *Water* will mortifie. But casually some *wheat* lay under the *Pan*, which was somewhat moistened by the *Suing* of the *Pan*; which in six weekes (as afore-said) looked mouldy to the *Eye*, but it was sprouted forth halfe a *Fingers* length.

410

It seemeth by these *Instances* of *Water*, that for *Nourishment*, the *Water* is almost all in all, and that the *Earth* doth but keepe the *Plant* upright, and save it from *Over-heat*, and *Over-cold*; And therefore is a *Comfortable Experiment* for good *Drinkers*. It proveth also that our former *Opinion*; That

411

Drinke



Drinke incorporate with Flesh, or Roots, (as in Capon-Beere, &c.) will nourish more easily, than Meat and Drinke taken severally.

412

The *Housing of Plants* (I conceive) will both *Accelerate Germination*, and bring forth *Flowers* and *Plants* in the *Colder Seasons*: And as we *House Hot Countrey Plants*, as *Lemons, Orenge, Myrtils*, to save them; So we may *House* our own *Countrey Plants*, to forward them, and make them come in the *Cold Seasons*; In such sort, that you may have *Violets, Strawberries, Pease*, all *Winter*: So that you sow, or remove them at fit times. This *Experiment* is to be referred unto the *Comforting* of the *Spirit* of the *Plant*, by *Warmth*, as well as *Housing* their *Boughs*, &c. So then the *Meanes*, to *Accelerate Germination*, are in Particular eight, in Generall three.

Experiments  
in Comfort,  
touching the  
Putting backe  
or Retardation  
of Germination.

413

**T**O make *Roses*, or other *Flowers* come late, it is an *Experiment* of *Pleasure*. For the *Ancients* esteemed much of *Rosa Sera*. And indeed the *November-Rose* is the sweetest, having been lesse exhiled by the *Sunne*. The *Meanes* are these. First, the *Cutting off their Tops*, immediately after they have done *Bearing*; And then they will come againe the same yeare about *November*: But they will not come just on the *Tops*, where they were cut, but out of those *Shoots*, which were (as it were,) *Water-Boughs*. The *Cause* is, for that the *Sap*, which otherwise would have fed the *Top*, (though after *Bearing*.) will, by the discharge of that, divert unto the *Side-Sprouts*; And they will come to beare, but later.

414

The *Second* is the *Pulling off the Buds of the Rose*, when they are *Newly knotted*; For then the *Side-Branches* will beare. The *Cause* is the same with the former: For *Cutting off the Tops*, and *Pulling off the Buds* worke the same *Effect*, in *Retention* of the *Sap* for a time, and *Diversiion* of it to the *Sprouts*, that were not so forward.

415

The *Third* is the *Cutting off* some few of the *Top-Boughes* in the *Spring-time*, but suffering the lower *Boughes* to grow on. The *Cause* is, for that the *Boughes* doe helpe to draw up the *Sap* more strongly; And we see that in *Powling* of *Trees*, many doe use to leave a *Bough* or two on the *Top*, to helpe to draw up the *Sap*. And it is reported also, that if you graft upon the *Bough* of a *Tree*, and cut off some of the old *Boughes*, the new *Cions* will perish.

416

The *Fourth* is by *Laying the Roots bare about Christmas*, some dayes. The *Cause* is plaine, for that it doth arrest the *Sap*, from going upwards, for a time; Which *Arrest* is afterwards released by the *Covering* of the *Root* againe with *Earth*; And then the *Sap* getteth up, but later.

417

The *Fifth* is the *Removing* of the *Tree*, some *Moneth* before it *Buddeth*. The *Cause* is, for that some time will be required after the *Remove*, for the *Resetling*, before it can draw the *Juyce*; And that time being lost, the *Blossome* must needs come forth later.

418

The *Sixth* is the *Grafting* of *Roses* in *May*, which commonly *Gardiners* doe not till *Iuly*; And then they beare not till the *Next Yeare*; But if you graft them in *May*, they will beare the same yeare, but late.

419

The *Seventh* is, the *Girding* of the *Body* of the *Tree* about with some *Pack-threed*; For that also in a degree, restraineth the *Sap*, and maketh it come up more late, and more *Slowly*.

420

The *Eighth* is, the *Planting* of them in a *Shade*, or in a *Hedge*; The *Cause* is, partly the *Keeping out* of the *Sunne*, which hasteneth the *Sap* to rise; And partly the *Robbing* of them of *Nourishment*, by the *Stuffe* in the *Hedge*. These *meanes* may be practised upon other, both *Trees*, and *Flowers*,  
*Mutatis Mutandis.* Men



Men have entertained a Conceit that sheweth prettily; Namely, that if you graft a *Late-Coming Fruit*, upon a Stocke of a *Fruit-Tree* that *Commeth early*, the Graft will beare *Fruit Early*; As a Peach upon a Cherry; And contrariwise, if an *Early-Coming-Fruit* upon a Stock of a *Fruit-Tree* that *Commeth late*, the Graft will beare *Fruit late*; As a Cherry upon a Peach. But these are but Imaginations, and untrue. The *Cause* is, for that the Cions overruleth the Stock quite; And the Stock is but Passive onely, and giveth Aliment, but no Motion to the Graft.

Wee will speake now, how to make *Fruits, Flowers*, and *Roots* larger; in more plenty; and sweeter; than they use to be; And how to make the *Trees* themselves, more Tall; more Spread; and more Hasty and Sudden; than they use to be. Wherein there is no doubt, but the former *Experiments* of *Acceleration*, will serve much to these Purposes. And again, that these *Experiments*, which we shall now set downe, doe serve also for *Acceleration*; because both Effects proceed from the Encrease of vigour in the Tree; But yet to avoid Confusion; And because some of the Means are more proper for the one Effect, and some for the other, we will handle them apart.

It is an assured Experience, that an *Heape* of *Flint*, or *Stone*, laid about the *Bottome* of a *Wilde-Tree*, (as an Oake, Elme, Ash, &c.) upon the first Planting, doth make it prosper double as much, as without it. The *Cause* is, for that it retaineth the Moisture, which falleth at any time upon the *Tree*, and suffereth it not to be exhaled by the Sunne. Again, it keepeth the *Tree* warme, from Cold Blasts and Frosts, as it were in an House. It may be also, there is somewhat in the Keeping of it steady at the first. *Quere*, if Laying of Straw some Height about the Body of a *Tree*, will not make the *Tree* forwards. For though the Root giveth the Sap, yet it is the Body that draweth it. But you must note, that if you lay *Stones* about the stalke of Lettuce, or other Plants, that are more soft, it will over-Moisten the Roots, so as the Wormes will eate them.

A *Tree*, at the first *Setting*, should not be *Shaken*, untill it hath taken *Root fully*: And therefore some have put two little Forkes about the *Bottome* of their *Trees*, to keep them upright; But after a yeares Rooting, then Shaking doth the *Tree* good, by Loosening of the Earth, and (perhaps) by Exercising (as it were) and Stirring the Sap of the *Tree*.

Generally, the *Cutting away* of *Boughes* and *Suckers* at the *Root* and *Body*, doth make *Trees* grow high; And contrariwise, the *Powling* and *Cutting* of the *Top*, maketh them grow spread, and bushy. As we see in *Pollards*, &c.

It is reported, that to make *hasty Growing Coppice-Woods*, the way is, to take *Willow*, *Sallow*, *Poplar*, *Alder*, of some seven yeares growth; And to set them, not upright, but a-slope, a reasonable depth under the Ground; And then, in stead of one Root, they will put forth many, and so carry more Shoots upon a Stemme.

When you would have many new *Roots* of *Fruit-Trees*, take a *Low Tree*, and bow it, and lay all his branches a-flat upon the Ground, and cast Earth upon them; And every *Twigge* will take Root. And this is a very profitable

421

Experiments  
in Consort,  
touching the  
Melioration of  
Fruits, Trees,  
and Plants.

422

423

424

425

426



ble *Experiment* for Costly *Trees*; (for the Boughes will make Stockes without charge;) Such as are *Apricots*, *Peaches*, *Almonds*, *Cornelians*, *Malberries*, *Figs*, &c. The like is continually practised with *Vines*, *Roses*, *Muske-Roses*, &c.

427

From *May* to *Iuly* you may take off the *Barke* of any *Bough*, being of the Bignesse of three or foure Inches, and cover the bare Place, somewhat above, and below, with Loame well tempered with Horse-dung, binding it fast downe. Then cut off the Bough about *Albathonide* in the bare Place, and set it in the Ground; And it will grow to be a faire *Tree* in one *Yeare*. The *Cause* may be, for that the *Baring* from the *Barke* keepeth the *Sap* from descending towards *Winter*, and so holdeth it in the Bough; And it may bee also that the Loam and Horse-dung applyed to the bare place, doe moisten it, and cherish it, and make it more apt to put forth the Root. Note, that this may be a generall Meanes for keeping up the *Sap* of *Trees* in their Boughes; Which may serve to other Effects.

428

It hath been practised in *Trees*, that shew faire, and beare not, to Bore a *Hole* thorow the *Heart* of the *Tree*, and thereupon it will beare. Which may be, for that the *Tree* before had too much *Repletion*, and was oppressed with his owne *Sap*; For *Repletion* is an *Enemie* to *Generation*.

429

It hath beene practised in *Trees*, that doe not beare, to cleave two or three of the *Chiefe* *Roots*, and to put into the Cleft a small *Pebble*, which may keepe it open, and then it will beare. The *Cause* may be, for that a *Root* of a *Tree* may be (as it were,) *Hide-bound*, no lesse than the *Body* of the *Tree*; but it will not keep open without somewhat put into it.

430

It is usually practised, to set *Trees* that require much *Sunne*, upon *walls* against the *South*; As *Apricots*, *Peaches*, *Plums*, *Vines*, *Figs*, and the like. It hath a double *Commoditie*; The one, the *Heat* of the *Wall* by *Reflexion*; The other, the *Taking away* of the *Shade*; For when a *Tree* groweth round, the upper Boughes over-shadow the lower: But when it is spread upon a *Wall*, the *Sunne* commeth alike, upon the upper, and lower *Branches*.

431

It hath also been practised (by some) to pull off some *Leaves* from the *Trees* so spread, that the *Sunne* may come upon the *Bough* and *Fruit* the better. There hath been practised also a *Curiositie*, to set a *Tree* upon the *North-Side* of a *Wall*, and at a little height, to draw him thorow the *Wall*, and spread him upon the *South-Side*: Conceiving that the *Root* and lower Part of the *Stocke* should enjoy the *Freshnesse* of the *Shade*; And the Upper Boughes, and *Fruit*, the *Comfort* of the *Sunne*. But it sorted not; The *Cause* is, for that the *Root* requireth some *Comfort* from the *Sunne*, though under *Earth*, as well as the *Bodie*: And the Lower Part of the *Bodie* more than the Upper, as wee see in *Compassing* a *Tree* below with straw.

432

The *Lownesse* of the *Bough*, where the *Fruit* commeth, maketh the *Fruit* greater, and to ripen better; For you shall ever see in *Apricots*, *Peaches*, or *Melo-Cotones*, upon a wall, the greatest *Fruits* towards the *Bottom*. And in *France* the *Grapes* that make the *Wine*, grow upon low *Vines*, bound to small *Stakes*. And the raised *Vines* in *Arbours* make but *Verjuice*. It is true, that in *Italy*, and other *Countries*, where they have hotter *Sunne*, they raise them upon *Elmes*, and *Trees*; But I conceive, that if the *French* Manner of *Planting* low, were brought in use there, their *Wines* would be stronger and sweeter. But it is more chargeable in respect of the *Props*. It were good to trie whether a *Tree* grafted somewhat neare the *Ground*, and the lower boughes onely maintained, and the higher continually pruned off, would not make a larger *Fruit*.

To



To have *Fruit* in *Greater Plentie*, the way is, to graft, not only upon young *Stocks*, but upon divers *Boughes* of an old *Tree*; for they will beare great Numbers of *Fruit*; Whereas if you graft but upon one *Stocke*, the *Tree* can beare but few.

433

The *Digging* yearly about the *Roots* of *Trees*, which is a great meanes, both to the *Acceleration* and *Melioration* of *Fruits*, is practised in nothing but in *Vines*; Which if it were transferred unto other *Trees*, and *Shrubs*, (as *Roses*, &c.) I conceive would advance them likewise.

434

It hath beene knowne, that a *Fruit-Tree* hath beene blown up (almost) by the *Roots*, and set up againe, and the next yeare bare exceedingly. The Cause of this, was nothing but the *Loosening* of the *Earth*, which comforteth any *Tree*, and is fit to be practised, more than it is, in *Fruit-Trees*: For *Trees* cannot be so fitly removed into *New Grounds*, as *Flowers* and *Herbs* may.

435

To revive an *Old Tree*, the *Digging* of it about the *Roots*, and *Applying* new *Mould* to the *Roots*, is the *Way*. We see also that *Draught-Oxen*, put into fresh *Pasture*, gather new and tender *Flesh*; And in all Things, better *Nourishment* than hath been used, doth helpe to renew; Especially, if it be not onely better, but changed, and differing from the former.

436

If an *Herbe* be cut off from the *Roots*, in the beginning of *Winter*, and then the *Earth* be trodden and beaten downe hard, with the *Foot* and *Spade*, the *Roots* will become of very great Magnitude in *Summer*. The Reason is, for that the *Moisture* being forbidden to come up in the *Plant*, stayeth longer in the *Root*, and so dilateth it. And *Gardiners* use to tread downe any loose *Ground*, after they have sowne *Onions*, or *Turnips*, &c.

437

If *Panicum* be laid below, and about the Bottome of a *Root*, it will cause the *Root* to grow to an Excessive Bignesse. The Cause is, for that being it selfe of a Spungy Substance, it draweth the *Moisture* of the *Earth* to it, and so feedeth the *Root*. This is of greatest use for *Onions*, *Turnips*, *Parships*, and *Carrets*.

438

The *Shifting* of *Ground* is a Meanes to better the *Tree*, and *Fruit*; But with this *Caution*; That all Things doe prosper best, when they are advanced to the better: Your *Nurserie* of *Stocks* ought to be in a more *Barren Ground*, than the *Ground* is whereunto you remove them. So all *Grassiers* preferre their *Cattell* from meaner *Pastures* to better. We see also, that *Hardnesse* in *Youth* lengthneth *Life*, because it leaveth a *Cherishing* to the better, of the *Body*, in *Age*: Nay in *Exercises*, it is good to begin with the hardest, as *Dancing* in *Thicke Shooes*, &c.

439

It hath beene observed, that *Hacking* of *Trees* in their *Barke*, both downe-right, and acrosse, so as you make them rather in *slices*, than in continued *Hacks*, doth great good to *Trees*; And especially delivereth them from being *Hide-bound*, and killeth their *Mosse*.

440

*Shade* to some *Plants* conduceth to make them large, and prosperous, more than *Sun*; As in *strawberries*, and *Bayer*, &c. Therefore amongst *strawberries*, sow here and there some *Borage Seed*; And you shall finde the *strawberries* under those *Leaves* farre more large than their *Fellowes*. And *Bayer* you must plant to the *North*; Or defend them from the *Sunne* by a *Hedge-Row*; And when you sow the *Berries*, weed not the *Borders*, for the first halfe yeare; For the *weed* giveth them *Shade*.

441

To increase the *Crops* of *Plants*, there would be considered, not onely the *Increasing* the *Lust* of the *Earth*, or of the *Plant*, but the *Saving* also of that which is spilt. So they have lately made a *Triall*, to *Set Wheat*; which neverthelesse

442



verthelesse hath beene left off, because of the trouble and paines; Yet so much is true, that there is much saved by the *Setting*, in comparifon of that which is *Sowen*; Both by keeping it from being picked up by Birds, And by Avoiding the Shallow lying of it, whereby much that is sown taketh no Root.

443

It is prescribed by some of the *Ancients*, that you take *Small Trees*, upon which *Figs* or other *Fruit* grow, being yet unripe, and cover the *Trees* in the Middle of *Autumne* with dung, untill the Spring; And then take them up in a warme day, and replant them in good Ground; And by that meanes, the former yeares *Tree* will be ripe, as by a new Birth; when other *Trees* of the same kinde, doe but blossome. But this seemeth to have no great Probabilitie.

444

It is reported, that if you take *Nitre*, and mingle it with *Water*, to the thicknesse of *Honey*, and therewith anoint the *Bud*, after the *Vine* is cut, it will sprout forth within eight dayes. The Cause is like to be, (if the *Experiment* be true,) the Opening of the *Bud*, and of the Parts Contiguous, by the Spirit of the *Nitre*; For *Nitre* is (as it were) the Life of *Vegetables*.

445

Take *Seed*, or *Kernells* of *Apples*, *Peares*, *Orenge*s; Or a *Peach*, or a *Plum-Stone*, &c. And put them into a *Squill*, (which is like a great *Onion*), and they will come up much earlier than in the *Earth* it self. This I conceive to be as a Kinde of *Grafting* in the *Root*; For as the *Stock* of a *Graft* yeeldeth better prepared Nourishment to the *Graft*, than the Crude *Earth*; So the *Squill* doth the like to the *Seed*. And I suppose the same would be done, by Putting *Kernells* into a *Turnip*, or the like; Save that the *Squill* is more Vigorous, and Hot. It may bee tried also, with putting *Onion-Seed* into an *Onion-Head*, which thereby (perhaps) will bring forth a larger, and earlier *Onion*.

446

The *Pricking* of a *Fruit* in severall places, when it is almost at his Bignesse, and before it ripeneth, hath beene practised with successe, to ripen the *Fruit* more suddenly. We see the Example of the *Biting* of *Wasps*, or *Wormes*, upon *Fruit*, whereby it (manifestly) ripeneth the sooner.

447

It is reported, that *Alga Marina* (*Sea-Weed*) put under the *Roots* of *Cole-worts*, and (perhaps) of other *Plants*, will further their Growth. The vertue (no doubt) hath Relation to *Salt*, which is a great Helpe to Fertilite.

448

It hath beene practised, to cut off the *Stalkes* of *Cucumbers*, immediately after their *Bearing*, close by the *Earth*, And then to cast a pretty Quantity of *Earth* upon the *Plant* that remaineth, and they will bear the next year *Fruit*, long before the ordinarie time. The Cause may be, for that the *Sap* goeth downe the sooner, and is not spent in the *Stalke* or *Leafe*, which remaineth after the *Fruit*. Where note, that the *Dying*, in the winter, of the *Roots* of *Plants*, that are *Annually*, seemeth to be partly caused by the Over-Expende of the *Sap* into *Stalke*, and *Leaves*; which being prevented, they will super-annate, if they stand warme.

449

The *Pulling* off many of the *Blossomes* from a *Fruit-Tree*, doth make the *Fruit* fairer. The Cause is manifest; For that the *Sap* hath the lesse to nourish. And it is a Common Experience, that if you doe not pull off some *Blossomes*, the first time a *Tree* bloometh, it will blossome it selfe to death.

450

It were good to trie, what would be the Effect, if all the *Blossomes* were pulled from a *Fruit-Tree*; Or the *Acornes*, and *Chestnut-buds*, &c. from a *Wilde Tree*, for two yeares together. I suppose that the *Tree* will either put forth, the third yeare, bigger, and more plentifull *Fruit*; Or else, the same yeares, larger *Leaves*, because of the *Sap* stored up.

It



It hath been generally received, that a *Plant watered* with *Warne Water*, will come up sooner and better, than with *Cold Water*, or with *Showers*. But our *Experiment* of *Watering Wheat* with *Warne Water* (as hath beene said) succeeded not; which may be, because the *Triall* was too late in the *Yeare*, viz. in the End of *October*. For the *Cold* then comming upon the *Seed*, after it was made more tender by the *Warne Water*, might checke it.

There is no doubt, but that *Grafting* (for the most Part) doth *meliorate* the *Fruit*. The *Cause* is manifest; For that the *Nourishment* is better prepared in the *Stocke*, than in the *Crude Earth*: But yet note well, that there bee some *Trees*, that are said to come up more happily from the *Kernell*, than from the *Graft*; As the *Peach*, and *Melocotone*. The *Cause* I suppose to bee, for that those *Plants* require a *Nourishment* of great *Moisture*; And though the *Nourishment* of the *Stocke* be finer, and better prepared, yet it is not so moist, and plentifull, as the *Nourishment* of the *Earth*. And indeed we see those *Fruits* are very *Cold Fruits* in their *Nature*.

It hath beene received, that a *Smaller Peare*, grafted upon a *Stocke* that beareth a greater *Peare*, will become *Great*. But I thinke it is as true, as that of the *Prime-Fruit* upon the *Late Stocke*; And *è controverso*; which we rejected before: For the *Cions* will governe. Neverthelesse it is probable enough, that if you can get a *Cions* to grow upon a *Stocke* of another kinde, that is much moyster than his own *stocke*, it may make the *Fruit* *Greater*, because it will yeeld more plentifull *Nourishment*; Though it is like it will make the *Fruit* *Baser*. But generally the *Grafting* is upon a drier *Stock*; As the *Apple* upon a *Crab*; The *Peare* upon a *Thorne*; &c. Yet it is reported, that in the *Low-Countries* they will graft an *Apple-Cions* upon the *Stock* of a *Colewort*, and it will beare a great flaggy *Apple*; The *Kernell* of which, if it be set, will bee a *Colewort*, and not an *Apple*. It were good to trie, whether an *Apple-Cions* will prosper, if it be grafted upon a *Sallow*, or upon a *Poplar*, or upon an *Alder*, or upon an *Elme*, or upon an *Horse-Plumme*, which are the moystest of *Trees*. I have heard that it hath beene tried upon an *Elme*, and succeeded.

It is manifest by *Experience*, that *Flowers* Removed wax greater, because the *Nourishment* is more easily come by, in the loose *Earth*. It may bee, that *Off Regrafting* of the same *Cions*, may likewise make *Fruit* greater; As if you take a *Cions*, and graft it upon a *Stocke* the first yeare; And then cut it off, and graft it upon another *Stock* the second yeare; and so for a third; Or fourth yeare; And then let it rest, it will yeeld afterward, when it beareth, the greater *Fruit*.

Of *Grafting* there are many *Experiments* worth the *Noting*, but those we reserve to a proper *Place*.

It maketh *Figs* better, if a *Fig-Tree*, when it beginneth to put forth *Leaves*, have his *Top* cut off. The *Cause* is plaine, for that the *Sap* hath the lesse to feed, and the lesse way to mount: But it may be, the *Figge* will come somewhat later, as was formerly touched. The same may bee tried likewise in other *Trees*.

It is reported, that *Mulberries* will be fairer, and the *Trees* more fruitfull, if you bore the *Trunke* of the *Tree* thorow, in severall places, and thrust into the *Places* bored, *Wedges* of some *Hot Trees*, as *Turpentine*, *Mastick-Tree*, *Guaiacum*, *Iuniper*, &c. The *Cause* may bee, for that *Adventive Heat* doth cheare up the *Native Juyce* of the *Tree*.

It is reported, that *Trees* will grow greater, and beare better *Fruit*, if you put *Salt*, or *Lees of Wine*, or *Bloud* to the *Root*. The *Cause* may be the *En-*

451

452

453

454

455

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457



creasing the Lust or Spirit of the *Root*; These Things being more forcible, than ordinarie *Composts*.

458

It is reported by one of the *Ancients*, that *Artichoakes* will be lesse prickly, and more tender, if the *Seeds* have their *Tops* dulled, or grated off upon a *Stone*.

459

*Herbs* will be tenderer, and fairer; if you take them out of *Beds*, when they are newly come up, and remove them into *Pots*, with better *Earth*. The Remove from *Bed* to *Bed* was spoken of before; But that was in severall yeares; This is upon the sudden. The *Cause* is the same with other *Removes*, formerly mentioned.

460

*Coleworts* are reported by one of the *Ancients*, to prosper exceedingly, and to be better tasted, if they be sometimes watred with *Salt-water*; And much more with *Water* mixed with *Nitre*; The Spirit of which is lesse Adurent than *Salt*.

461

It is reported, that *Cucumbers* will prove more Tender, and Dainty, if their *Seeds* be Steeped (a little) in *Milke*; The *Cause* may be, for that the *Seed* being mollified with the *Milke*, will be too weake to draw the grosser Juyce of the *Earth*, but onely the finer. The same *Experiment* may be made in *Artichoakes*, and other *Seeds*, when you would take away, either their *Flashiness*, or *Bitterness*. They speake also, that the like Effect followeth, of Steeping in *Water* mixed with *Honey*; But that seemeth to me not so probable, because *Honey* hath too Quicke a Spirit.

462

It is reported that *Cucumbers* will be lesse watry, and more *Melon-like*, if in the *Pit* where you set them, you fill it (half way up) with *Chasse*, or small *Sticks*, and then powre *Earth* upon them; For *Cucumbers*, as it seemeth, doe extremely affect *Moisture*; And over-drinke themselves; Which this *Chasse*, or *Chips*, forbiddeth. Nay, it is further reported, that if when a *Cucumber* is growne, you set a *Pot* of water about five or six Inches distance from it, it will, in 24. houres, shoot so much out, as to touch the *Pot*; Which if it be true, it is an *Experiment* of an higher Nature, than belongeth to this *Title*: For it discovereth *Perception* in *Plants*, to move towards that which should help and comfort them, though it be at a distance. The ancient Tradition of the *Vine* is farre more strange: It is, that if you set a *Stake*, or *Prop*, some distance from it, it will grow that way; Which is farre stranger (as is said) than the other: For that *Water* may worke by a *Sympathie* of *Attraction*: But this of the *Stake* seemeth to be a Reasonable Discourse.

463

It hath been touched before, that *Terebration* of *Trees* doth make them prosper better. But it is found also, that it maketh the *Fruit* sweeter, and better. The *Cause* is, for that notwithstanding the *Terebration*, they may receive *Aliment* sufficient; And yet no more than they can well turne, and digest; And withall doe sweat out the coursest and unprofitablest Juyce; Even as it is in *Living Creatures*, which by Moderate Feeding, and Exercise, and Sweat, attaine the soundest Habite of Body.

464

As *Terebration* doth Meliorate *Fruit*, so, upon the like reason, doth Letting of *Plants* *Bloud*; As *Pricking Vines*, or other *Trees*, after they be of some Growth; And thereby letting forth *Gumme*, or *Teares*; Though this be not to continue, as it is in *Terebration*, but at some Seasons. And it is reported, that by this Artifice, *Bitter Almonds* have beene turned into *Sweet*.

465

The *Ancients* for the Dalscorating of *Fruit*, doe commend *Swines-Dung* above all other *Dung*; Which may bee, because of the *Moisture* of that *Beast*, whereby the *Excrement* hath lesse *Acrimony*; For we see *Swines* and *Pigges* *Flesh* is the *Moistest* of *Fleshes*.



It is observed by some, that all *Herbs* wax sweeter, both in Smell and Taste, if after they be growne up some reasonable time, they be cut, and so you take the later Sprout. The Cause may be for that the longer the Juyce stayeth in the Root, and Stalke, the better it concocteth. For one of the Chiefe Causes, why *Graines*, *Seeds*, and *Fruits*, are more Nourishing than *Leaves*, is the length of time, in which they grow to *Maturation*. It were not amisse to keepe backe the Sap of *Herbs*, or the like, by some fit meanes, till the end of Summer; whereby (it may be) they will be more Nourishing.

As *Grafting* doth generally advance and *Meliorate Fruits*, above that which they would be, if they were set of *Kernels*, or *Stones*, in regard the Nourishment is better concocted; So (no doubt) even in *Grafting*, for the same cause, the Choyce of the *Stocke* doth much; Alwayes provided, that it bee somewhat inferiour to the *Cions*: For otherwise it dullerh it. They commend much the *Grafting* of *Peares*, or *Apples*, upon a *Quince*.

Besides the *Meanes* of *Melioration* of *Fruits*, before mentioned, it is set downe as tried, that a *Mixture* of *Bran*, and *Swines-Dung*; Or *Chasse* and *Swines-Dung*; (especially laid up together for a Moneth or rot,) is a very great Nourisher, and Comforter to a *Fruit-Tree*.

It is delivered, that *Onions* wax greater, if they be taken out of the Earth, and laid a drying twenty dayes, and then set againe; And yet more, if the outermost *Pill* be taken off all over.

It is delivered by some, that if one take the *Bough* of a *Low-Fruit-tree*, newly budded, and draw it gently, without hurting it, into an *Earthen Pot* perforate at the bottome to let in the *Plant*, and then cover the *Pot* with Earth, it will yeeld a very large *Fruit*, within the Ground. Which *Experiment* is Nothing but *Potting* of *Plants*, without Removing, and Leaving the *Fruit* in the Earth. The like, (they say,) will be effected, by an *Empty Pot* without Earth in it, put over a *Fruit*, being propped up with a *Stake*, as it hangeth upon the *Tree*; And the better, if some few *Pertusions* be made in the *Pot*. Wherein, besides the *Defending* of the *Fruit*, from *Extremity* of *Sunne* or *Weather*, some give a reason, that the *Fruit*, Loving and Coveting the open *Aire* and *Sunne*, is invited by those *Pertusions*, to spread and approach, as neare the open *Aire*, as it can; And so enlargeth in *Magnitude*.

All *Trees*, in *High* and *Sandy Grounds*, are to be set deep; And in *Warry Grounds*, more shallow. And in all *Trees*, when they be removed (especially *Fruit-Trees*) care ought to be taken, that the *Sides* of the *Trees* be coasted, (*North* and *South*, &c.) as they stood before. The same is said also of *Stone* out of the *Quarry*, to make it more durable; Though that seemeth to have lesse reason; Because the *Stone* lyeth not so neare the *Sunne*, as the *Tree* groweth.

*Timber Trees* in a *Coppice Wood*, doe grow better, than in an *Open Field*; Both because, they offer not to spread so much, but shoot up still in *Height*; And chiefly because they are defended from too much *Sunne* and *Winde*, which doe checke the *Growth* of all *Fruit*; And so (no doubt) *Fruit-Trees*, or *Vines*, set upon a *Wall*, against the *Sunne*, betweene *Elbowes* or *Buttresses* of *Stone*, ripen more, than upon a *Plain Wall*.

It is said, that if *Potato Roots*, be set in a *Pot* filled with Earth, and then the *Pot* with Earth be set likewise within the Ground, some two or three Inches, the *Roots* will grow greater, than Ordinary. The Cause may be, for that Having Earth enough within the *Pot* to nourish them; And then being stopped by the Bottome of the *Pot* from putting *Strings* downward, they must needs grow greater in *Breadth*, and *Thicknesse*. And it may be, that



that all *Seeds* or *Roots*, *Planted*, and so set into the *Earth*, will prosper the better.

474

The *Cutting* off the *Leaves* of *Radish*, or other *Roots*, in the beginning of *Winter*, before they wither; And *Covering* againe the *Root*, something high with *Earth*; Will preserve the *Root* all *Winter*, and make it bigger, in the *Spring* following, as hath beene partly touched before. So that there is a double Use of this *Cutting* off the *Leaves*: For in *Plants*, where the *Root* is the *Esculent*, as *Radish*, and *Parsnips*, it will make the *Root* the greater: And so it will doe to the *Heads* of *Onions*. And where the *Fruit* is the *Esculent*, by *Strengthening* the *Root*, it will make the *Fruit* also the greater.

475

It is an *Experiment* of great pleasure, to make the *Leaves* of *Shady Trees*, larger than ordinary. It hath beene tryed (for certaine) that a *Cions* of a *Weech-Elme*, grafted upon the *Stocke* of an Ordinary *Elme*, will put forth *Leaves*, almost as broad as the *Brimme* of ones *Hat*. And it is very likely, that as in *Fruit-Trees*, the *Graft* maketh a greater *Fruit*; So in *Trees* that beare no *Fruit*, it will make the greater *Leaves*. It would be tried therefore in *Trees* of that kinde chiefly; As *Birch*, *Asp*, *Willow*; And especially the *Shining Willow*, which they call *Swallow-Taile*, because of the pleasure of the *Leafe*.

476

The *Barrennesse* of *Trees*, by *Accident*, (besides the *Weaknesse* of the *Soile*, *Seed*, or *Root*; And the *Injurie* of the *Weather*) commeth either of their *Over-growing* with *Mosse*; Or their being *Hide-bound*; Or their *Planting* too deepe; Or by *Issuing* of the *Sap* too much into the *Leaves*. For all these there are *Remedies* mentioned before.

Experiments  
in Consort,  
touching  
Compound  
Fruits and  
Flowers.

Wee see that in *Living Creatures*, that have *Male* and *Female*, there is *Copulation* of severall *Kindes*; and so *Compound Creatures*; As the *Mule*, that is generated betwixt the *Horse* and the *Asse*; And some other *Compounds*, which we call *Monsters*, though more rare: And it is held, that that *Proverbe*, *Africa semper aliquid Monstri parit*; commeth, for that the *Fountains* of *Waters* there, being rare, divers *Sorts* of *Beasts* come from severall *Parts* to drink; And so being refreshed, fall to couple, & many times with severall *Kinds*. The *Compounding* or *Mixture* of *Kinds* in *Plants* is not found out; which neverthelesse, if it bee possible, is more at command than that of *living Creatures*; For that their *Lust* requireth a voluntary *Motion*: wherefore it were One of the most *Notable Experiments* touching *Plants*, to finde it out: For so you may have great *Variety* of New *Fruits*, and *Flowers* yet unknowne. *Grafting* doth it not: That mendeth the *Fruit*, or doubleth the *Flowers*, &c. But it hath not the *Power* to make a *New Kinde*. For the *Cions* ever over-ruleth the *Stocke*.

477

It hath been set downe by one of the *Ancients*, that if you take two *Twigs* of severall *Fruit Trees*, and flat them on the *Sides*, and then binde them close together, and set them in the ground, they will come up in one *Stocke*; But yet they will put forth their severall *Fruits* without any *Commixture* in the *Fruit*. Wherein note (by the way) that *Unity* of *Continuance*, is easier to procure,



procure, than *Vnitie of Species*. It is reported also that *Vines of Red and White Grapes*, being set in the Ground, and the upper Parts being flatted, and bound close together, will put forth *Grapes of the severall Colours*, upon the same Branch; And *Grape-Stones of severall Colours* within the same *Grape*: But the more, after a yeare or two; The *Unity* (as it seemeth) growing more Perfect. And this will likewise helpe, if from the first *Vniting*, they be often Watred; For all Moisture helpeth to *Vnion*. And it is prescribed also, to binde the *Bud*, as soone as it commeth forth, as well as the *Stocke*; At the least for a time.

They report, that divers *Seeds*, put into a *Clout*, and laid in Earth well dugged, will put up *Plants Contiguous*; Which (afterwards) being bound in, their *Shoots* will *Incorporate*. The like is said of *Kernels*, put into a *Bottle*, with a Narrow Mouth, filled with Earth.

It is reported, that young *Trees of severall kindes*, set contiguous without any binding, and very often Watred, in a *Fruitfull Ground*, with the very Luxury of the *Trees*, will incorporate, and grow together. Which seemeth to me the likeliest Meanes, that hath beene propounded; For that the *Binding* doth hinder the Naturall Swelling of the *Tree*; which, while it is in Motion, doth better unite.

There are many Ancient and Received Traditions and Observations, touching the *Sympathy* and *Antipathy* of *Plants*; For that some will thrive best growing neare others; which they impute to *Sympathy*: And some worse; w<sup>ch</sup> they impute to *Antipathy*. But these are Idle & Ignorant Conceits; And forsake the true Indication of the *Causes*; As the most Part of *Experiments*, that concerne *Sympathies* and *Antipathies* doe. For as to *Plants*, neither is there any such Secret *Friendship*, or *Hatred*, as they imagine; And if we should be content to call it *Sympathy*, and *Antipathy*, it is utterly mistaken; For their *Sympathy* is an *Antipathy*, and their *Antipathy* is a *Sympathy*: For it is thus; Wheresoever one *Plant* draweth such a particular *Juyce* out of the Earth, as it qualifieth the Earth; So as that *Juyce* which remaineth is fit for the other *Plant*, there the Neighbourhood doth good; Because the Nourishments are contrarie, or severall: But where two *Plants* draw (much) the same *Juyce*, there the Neighbourhood hurteth; For the one deceiveth the other.

First therefore, all *Plants* that doe draw much *Nourishment* from the Earth, and so soake the Earth, and exhaust it; hurt all Things that grow by them; As *Great Trees*, (especially *Ashes*,) and such *Trees*, as spread their *Roots*, neare the Top of the Ground. So the *Colewort* is not an Enemy (though that were anciently received) to the *Vine* onely; But it is an Enemy to any other *Plant*; Because it draweth strongly the fattest *Juyce* of the Earth. And if it be true, that the *Vine*, when it creepeth neare the *Colewort*, will turne away; This may be, because there it findeth worse Nourishment; For though the *Root* be where it was, yet (I doubt) the *Plant* will bend as it nourisheth.

478

479

Experiments  
in Consort  
touching the  
*Sympathy* and  
*Antipathy* of  
*Plants*.

480



481

Where *Plants* are of severall Natures, and draw severall Juyces out of the Earth, there (as hath been said) the One set by the other helpeth: As it is set down by divers of the Ancients, that *Rew* doth prosper much, and becommeth stronger, if it bee set by a *Figge-Tree*: which (wee conceive) is caused, Not by Reason of *Friendship*, but by *Extraction* of a Contrary Juyce: The one Drawing *Juyce* fit to result Sweet, the other bitter. So they have set downe likewise, that a *Rose* set by *Garlick* is sweeter: Which likewise may be, because the more Fetide Juyce of the Earth goeth into the *Garlick*; And the more Odorate into the *Rose*.

482

This wee see manifestly, that there be certaine *Corne-Flowers*, which come seldome or never in other places, unlesse they be set; But onely amongst *Corne*: As the *Blew-Bottle*, a kinde of *Yellow Mary-Gold*, *wilde Poppy*, and *Fumitory*. Neither can this be, by Reason of the Culture of the Ground, by Plowing, or Furrowing; As some *Herbs*, and *Flowers*, will grow but in *Ditches* new Cast; For if the *Ground* lie fallow, and unsowne, they will not come: So as it should seeme to be the *Corne*, that qualifieth the Earth, and prepareth it for their Growth:

483

This Observation, if it holdeth, (as it is very probable,) is of great use, for the *Meliorating* of *Taste* in *Fruits*, and *Esculent Herbs*; And of the *Sent* of *Flowers*. For I doe not doubt, but if the *Figge-Tree* doe make the *Rew* more strong, and bitter, (as the Ancients have noted,) good store of *Rew* planted about the *Figge-Tree*, will make the *Figge* more sweet. Now the *Tastes* that doe most offend in *Fruits*, and *Herbs*, and *Roots*, are *Bitter*; *Harrish*; *Sowre*; And *wairish*, or *Flasby*. It were good therefore to make the *Trials* following.

484

Take *Wormewood*, or *Rew*, and set it neare *Lettuce*, or *Coleflory*, or *Artichoke*; And see whether the *Lettuce*, or the *Coleflorie*, &c. become not the sweeter.

485

Take a *Service-Tree*, or a *Cornelian-tree*, or an *Elder-Tree*, which we know have *Fruits* of harsh and binding Juyce, and set them neare a *Vine*, or *Figge-Tree*, and see whether the *Grapes*, or *Figges*, will not be the sweeter.

486

Take *Cucumbers*, or *Pumpions*, and set them (here and there) amongst *Musk-Melons*, and see whether the *Melons* will not be more *Winy*, and better tasted. Set *Cucumbers* (likewise) amongst *Radish*, and see whether the *Radish* will not be made the more *Biring*.

487

Take *Sorrell*, and set it amongst *Rasps*, and see whether the *Rasps* will not be the sweeter.

488

Take *Common Briar*, and set it amongst *Violets*, or *Wall-Flowers*, and see whether it will not make the *Violets*, or *Wall-Flowers* sweeter, and lesse Earthy in their *Smell*. So set *Lettuce*, or *Cucumbers*, amongst *Rosemary*, or *Bayes*, and see whether the *Rosemary*, or *Bayes* will not be the more Odorate, or Aromaticall.

489

Contrariwise, you must take heed, how you set *Herbs* together, that draw much the like Juyce. And therefore I thinke *Rosemary* will leese in Sweetnesse, if it be set with *Lavender*, or *Bayes*, or the like. But yet, if you will correct the strength of an Herbe, you shall doe well to set other like Herbs by him, to take him downe; And if you should set *Tansy* by *Angelica*, it may bee, the *Angelica* would be the weaker, and fitter for Mixture in Perfume. And if you should set *Rew* by *Common Wormewood*, it may be, the *Wormewood* would turne to be liker *Roman wormewood*.

490

This *Axiome* is of large extent; And therefore would be severed, and refined by *Tryall*. Neither must you expect to have a *Grosse Difference* by this kinde of Culture, but only *Further Perfection*. Triall



Triall would bee also made in *Herbs Poysonous*, and *Purgative*, whose ill Qualitie (perhaps) may be discharged, or attempted, by Setting stronger *Poysons*, or *Purgatives*, by them.

It is reported, that the *Shrub* called *Our Ladies Seale*; (which is a Kinde of *Briony*,) and *Coleworts*, set neare together, one or both will die. The Cause is, for that they be both great Depredatours of the Earth, and one of them starveth the other. The like is said of a *Reed*, and a *Brake*; Both which are succulent; And therefore the One deceiveth the Other. And the like of *Hemlock* and *Rew*; Both which draw strong Juices.

Some of the Ancients, and likewise divers of the Moderne Writers, that have laboured in *Naturall Magick*, have noted a *Sympathy*, between the *Sunne*, *Moone*, and some Principall *Starres*; And certaine *Herbs*, and *Plants*. And so they have denominated some *Herbs Solar*, and some *Lunar*; And such like Toyes put into great Words. It is manifest, that there are some *Flowers*, that have Respect to the *Sunne*, in two Kindes; The one by Opening and Shutting; And the other by Bowing and Inclining the Head. For *Mary-golds*, *Tullippas*, *Pimpernell*, and indeed most *Flowers*, doe open or spread their Leaves abroad, when the *Sunne* shineth serene and faire: And againe, (in some part,) close them, or gather them inward, either towards Night, or when the Skie is overcast. Of this there needeth no such Solemne Reason to be assigned; As to say, that they rejoyce at the presence of the *Sunne*; And mourne at the absence thereof. For it is Nothing else, but a little Loading of the Leaves, and Swelling them at the Bottome, with the Moisture of the Aire; whereas the drie Aire doth extend them: And they make it a Peece of the wonder, that *Garden Claver* will hide the *Stalke*, when the *Sunne* sheweth bright; Which is nothing, but a full Expansion of the leaves. For the Bowing and Inclining the Head; it is found in the great *Flower* of the *Sunne*; in *Marigolds*; *Wart-wort*; *Mallow Flowers*; and others. The Cause is somewhat more Obscure than the former; But I take it to bee no other, but that the Part against which the *Sunne* beateth, waxeth more faint and flaccide in the *Stalke*; And therby lesse able to support the *Flower*.

What a little Moisture will doe in *Vegetables*, even though they be dead, and severed from the Earth, appeareth wel in the Experiment of *Juglers*. They take the *Beard* of an *Oate*; which (if you marke it well,) is wreathed at the Bottome, and one smooth entire Straw at the Top. They take onely the Part that is Wreathed, and cut off the other, leaving the *Beard* halfe the Breadth of a Finger in length. Then they make a little *Crosse* of a *Quill*, long-ways of that Part of the *Quill*, which hath the Pith; And *Crosse*-ways of that Peece of the *Quill* without Pith; The whole *Crosse* being the Breadth of a Finger high. Then they pricke the Bottome where the *Pith* is, and thereinto they put the *Oaten-beard*, leaving halfe of it sticking forth of the *Quill*: Then they take a little white Box of wood, to deceive Men, as if somewhat in the Box did worke the Feat: In which, with a Pinne, they make a little Hole, enough to take the *Beard*, but not to let the *Crosse* sinke downe, but to stick. Then likewise by way of Imposture, they make a Question; As, Who is the Fairest Woman in the Company? Or, Who hath a Glove, or Card? And cause Another to name divers Persons: And upon every Naming, they stick the *Crosse* in the Box, having first put it towards their mouth, as if they charmed it; And the *Crosse* stirreth not; But when they come to the Person that they would take; As they hold the *Crosse* to their Mouth, they touch the *Beard* with the Tip of their Tongue, and wet it; And so stick the *Crosse* in the Box; And then you shall see it turne finely and

491

492

493

494



and softly, three or foure Turnes; which is caused by the untwining of the *Beard* by the Moisture. You may see it more evidently, if you sticke the *Crosse* betweene your fingers, in stead of the *Box*; And therefore you may see, that this Motion, which is Effected by so little Wet, is stronger than the Closing or Bending of the Head of a *Marigold*.

495

It is reported by some, that the *Herbe* called *Rosa-Solis*, (whereof they make Strong Waters,) will at the Noone-day, when the *Sunne* shineth hot and bright, have a great Dew upon it. And therefore, that the right Name is *Ros Solis*: which they impute to a Delight and *Sympathy*, that it hath with the *Sunne*. Men favour Wonders. It were good first to be sure, that the Dew that is found upon it, be not the Dew of the Morning Preserved, when the Dew of other *Herbs* is breathed away; for it hath a smooth and thick Leafe, that doth not discharge the Dew so soone, as other *Herbs* that are more Spungy and Porous. And it may be Purslane, or some other *Herbe*, doth the like, and is not marked. But if it be so, that it hath more Dew at Noon, than in the Morning, then sure it seemeth to be an Exudation of the *Herbe* it selfe. As Plumes sweat when they are set into the Oven: for you will not (I hope) thinke, that it is like *Gedeons Fleece* of *Wooll*, that the Dew should fall upon that, and no where else.

496

It is certaine, that the *Honey-dews*, are found more upon *Oake-leaves*, than upon *Ash*, or *Beech*, or the like: But whether any Cause be, from the Leafe it selfe, to concoct the Dew; Or whether it be onely, that the Leafe is Close and Smooth; (And therefore drinketh not in the Dew, but preserveth it,) may be doubted. It would be well inquired, whether *Manna* the *Drug*, doth fall but upon certaine *Herbs* or *Leaves* onely. *Flowers* that have deep *Sockets*, doe gather in the Bottome, a kinde of *Honey*; As *Honey-Suckles*; (both the *Woodbine*, and the *Trifoile*;) *Lillies*; and the like. And in them certainly the *Flower* beareth part with the Dew.

497

The Experience is, that the *Froth*, which they call *Woodesare*, (being like a kinde of Spittle,) is found but upon certaine *Herbs*, and those hot Ones; As *Lavender*, *Lavender-cotton*, *Sage*, *Hyssope*, &c. Of the Cause of this enquire further; For it seemeth a Secret. There falleth also *Mildew* upon *Corne*, and smutteth it; But it may be, that the same falleth also upon other *Herbs*, and is not observed.

498

It were good, Triall were made, whether the great Consent betweene *Plants* and *Water*, which is a principall Nourishment of them, will make an *Attraction* or Distance, and not at Touch onely. Therefore take a *Vessell*, and in the middle of it make a false Bottome of course *Canvasse*: Fill it with Earth above the *Canvasse*, and let not the Earth be watred; Then sow some good *Seeds* in that Earth; But under the *Canvasse*, some halfe a foot in the Bottome of the *Vessell*, lay a great *Sponge*, thorowly wet in water; And let it lye so some ten *Dayes*; And see whether the *Seeds* will sprout, and the Earth become more Moist, and the *Sponge* more drie. The Experiment formerly mentioned of the *Cucumber*, creeping to the Pot of Water, is farre stranger than this.

Experiments  
in Consort,  
touching the  
Making Herbs  
and Fruits  
Medicinable.

499

**T**He Altering of the *Sent*, *Colour*, or *Taste* of *Fruit*, by *Infusing*, *Mixing*, or *Letting* into the *Barke*, or *Root* of the *Tree*, *Herbe*, or *Flower*, any *Coloured*, *Aromaticall*, or *Medicinall* Substance; are but *Fancies*. The Cause is, for that those Things have passed their Period, and nourish not. And all Alteration of Vegetables, in those Qualities, must be by somewhat, that is apt to go in to the Nourishment of the *Plant*. But this is true, that where *Kine* feed upon

wilde



*wilde Garlicke*, their *Milke* tasteth plainly of the *Garlicke*: And the *Flesh* of *Muttons* is better tasted where the *Sheepe* feed upon *Wilde Thyme*, and other wholesome *Herbs*. *Galen* also speaketh of the Curing of the *Scirrus* of the *Liver*, by *Milke* of a *Cow*, that feedeth upon certaine *Herbs*; And *Honey* in *Spaine* smelleth (apparently) of the *Rosemary*, or *Orenge*, from whence the *Bee* gathereth it: And there is an old Tradition of a *Maiden* that was fed with *Napellus*, (which is counted the Strongest poyson of all *Vegetables*; which with use did not hurt the *Maid*, but poisoned some that had Carnall Company with her. So it is observed by some, that there is a vertuous *Bezoar*, and another without vertue; which appeare to the shew alike; But the Vertuous is taken from the *Beast*, that feedeth upon the *Mountaines*, where there are *Theriacall Herbs*; And that without Vertue, from those that feed in the *Valleys*, where no such *Herbs* are. Thus farre I am of Opinion; That as *Steepled VVines* and *Beeres*, are very *Medicinall*; And likewise *Bread* tempred with divers *Powders*; So of *Meat* also, (as *Flesh*, *Fish*, *Milke*, and *Egges*,) that they may be made of great use for *Medicine*, and *Diet*, if the *Beast*, *Foule*, or *Fish*, be fed with a speciall kinde of food, fit for the *Disease*. It were a dangerous Thing also for secret *Empoysonments*. But whether it may be applied unto *Plants*, and *Herbs*, I doubt more; Because the *Nourishment* of them is a more common *Juyce*; which is hardly capble of any speciall *Qualitie*, untill the *Plant* doe assimilate it.

But least our *Incredulitie* may prejudice any profitable *Operations* in this kinde, (especially since Many of the *Ancients* have set them downe,) Wee thinke good briefly to propound the foure *Meanes*, which they have devised of Making *Plants* *Medicinable*. The First is by *Slitting* of the *Root*, and *Infusing* into it the *Medicine*; As *Hellebore*, *Opium*, *Scammony*, *Triacle*, &c. And then binding it up againe. This seemeth to me the least probable; Because the *Root* draweth immediately from the *Earth*; And so the *Nourishment* is the more *Common*, and lesse *Qualified*: And besides, it is a long time in *Going* up, ere it come to the *Fruit*. The Second *VVay* is, to *Perforate* the *Body* of the *Tree*, and there to *Infuse* the *Medicine*: Which is somewhat better: For if any *Vertue* be received from the *Medicine*, it hath the lesse way, and the lesse time to goe up. The Third is, the *Steeping* of the *Seed* or *Kernell* in some *Liquour*, wherein the *Medicine* is *Infused*: Which I have little Opinion of, because the *Seed*, (I doubt,) will not draw the *Parts* of the *Matter*, which have the *Propriety*: But it will be farre the more likely, if you mingle the *Medicine* with *Dung*; For that the *Seed* naturally drawing the *Moisture* of the *Dung*, may call in withall some of the *Propriety*. The fourth is, the *Watering* of the *Plant* oft, with an *Infusion* of the *Medicine*. This, in one respect may have more force than the rest; Because the *Medication* is oft renewed; Whereas the rest are applied but at one time: And therefore the *Vertue* may the sooner vanish. But still I doubt, that the *Root* is somewhat too stubborn to receive those fine *Impressions*; And besides, (as I said before,) they have a great *Hill* to goe up. I judge therefore the likeliest way to be the *Perforation* of the *Body* of the *Tree*, in severall places, one above the other; And the *Filling* of the *Holes* with *Dung* mingled with the *Medicine*.

And the *Warring* of those *Lumps* of *Dung*, with *Squirts* of an *Infusion* of the *Medicine* in *Dunged Water*, once in three or foure *Dayes*.

NATU-









# NATVRALL HISTORIE.

## VI. Century.



**O**UR *Experiments* wee take care to bee, (as wee have often said,) either *Experimenta Fructifera*, or *Lucifera*; Either of *Vse*, or of *Discovery*: For wee hate *Impostures*; And despise *Curiosities*. Yet because wee must apply our Selves somewhat to Others, we will set down some *Curiosities* touching *Plants*.

Experiments  
in Confort  
touching  
*Curiosities*  
about Fruits  
and Plants.

It is a *Curiositie*, to have severall *Fruits* upon one *Tree*; And the more, when some of them come *Earely*, and some come *Late*; So that you may have, upon the same *Tree*, Ripe *Fruits* all Sommer. This is easily done, by Grafting of severall *Cions*, upon severall Boughes, of a Stock, in a good Ground, plentifully fed. So you may have all Kindes of *Cherries*, and all kinds of *Plums*, and *Peaches*, and *Apricots*, upon one *Tree*; But I conceive the *Diversitie* of *Fruits* must be such, as will graft upon the same Stock. And therefore I doubt, whether you can have *Apples*, or *Peares*, or *Oranges*, upon the same Stocke, upon which you graft *Plums*.

501

It is a *Curiosity* to have *Fruits* of *Divers Shapes*, and *Figures*. This is easily performed by Moulding them, when the *Fruit* is young, with Moulds of Earth, or Wood. So you may have *Cucumbers*, &c. as Long as a Cane; Or as round as a Spheare; Or formed like a Crosse. You may have also *Apples*, in the forme of *Peares*, or *Lemons*. You may have also *Fruit* in more Accurate *Figures*; As we said of *Men*, *Beasts*, or *Birds*, according as you make the Moulds. Wherein you must understand, that you make the Mould big enough, to containe the whole *Fruit*, when it is growne to the greatest: For else you will choake the Spreading of the *Fruit*; Which otherwise would spread it selfe, and fill the Concave, and so be turned into the *Shape* desired; As it is in Mouldworkes of Liquid things. Some doubt may be conceived,

502



ceived, that the Keeping of the Sunne from the *Fruit*, may hurt it : But there is ordinary experience of *Fruit* that groweth Covered. *Quære* also, whether some small Holes, may not be made in the Wood, to let in the Sunne. And note, that it were best to make the Moulds partible, glued, or cemented together, that you may open them, when you take out the *Fruit*.

503 It is a *Curiosity*, to have *Inscriptions*, or *Engravings*, in *Fruit*, or *Trees*. This is easily performed, by *Writing* with a *Needle*, or *Bodkin*, or *Knife*, or the like, when the *Fruit*, or *Trees* are young ; For as they grow, so the Letters will grow more large, and Graphicall.

— *Tenerisque meos incidere Amores*  
*Arboribus, crescent illæ, crescentis Amores.*

504 You may have *Trees* apparelled with *Flowers*, or *Herbs*, by *Boring Holes* in the *Bodies* of them, and Putting into them *Earth* holpen with *Mucke*, and *Setting Seeds*, or *Slips*, of *Violets*, *Strawberries*, *Wilde-Thyme*, *Camomill*, and such like in the *Earth*. Wherein they doe but grow, in the *Tree*, as they doe in *Pots* ; Though (perhaps) with some Feeding from the *Trees*. It would bee tried also with *Shoots* of *Vines*, and *Roots* of *Red-Roses* ; For it may be, they being of a more *Ligneous Nature*, will incorporate with the *Tree* it selfe.

505 It is an ordinary *Curiosity*, to *Forme Trees* and *Shrubs*, (as *Rosemary*, *Juniper*, and the like,) into *Sundry Shapes* ; which is done by Moulding them within, and Cutting them without. But they are but lame Things, being too small to keepe *Figure* : Great *Castles* made of *Trees* upon *Frames* of *Timber*, with *Turrets*, and *Arches*, were anciently matters of *Magnificence*.

506 Amongst *Curiosities*, I shall place *Colouration*, though it be somewhat better : For *Beauty* in *Flowers* is their Preheminence. It is observed by some, that *Gilly-Flowers*, *Sweet-williams*, *Violets*, that are *Coloured*, if they be neglected, and neither *Watered*, nor *New Moulded*, nor *Transplanted*, will turne *White*. And it is probable, that the *White* with much culture, may turne *Coloured*. For this is certaine, that the *White Colour* commeth of *Scarcity* of *Nourishment* ; Except in *Flowers* that are onely *White*, and admit no other *Colours*.

507 It is good therefore, to see what *Natures* doe accompany what *Colours* ; For by that you shall have *Light*, how to induce *Colours*, by Producing those *Natures*. *Whites* are more *Inodorate*, (for the most part,) than *Flowers* of the same kinde *Coloured* ; As is found in *Single White Violets*, *White-Roses*, *White Gilly-Flowers*, *White Stock-Gilly-Flowers*, &c. We finde also, that *Blossomes* of *Trees*, that are *White*, are commonly *Inodorate*, As *Cherries*, *Peares*, *Plums* ; Whereas those of *Apples*, *Crabs*, *Almonds*, and *Peaches*, are *Blushy*, and *Smell sweet*. The *Cause* is, For that the *Substance* that Maketh the *Flower*, is of the thinnest and finest of the *Plant* ; Which also maketh *Flowers* to be of so dainty *Colours*. And if it be too *Sparing*, and *Thinne*, it attaineth no *Strength* of *Odour* ; Except it be in such *Plants*, as are very *Succulent*. Whereby they need rather to be scantied in their *Nourishment*, than replenished, to have them *sweet*. As wee see in *White Satyrion*, which is of a *Dainty Smell* ; And in *Beane-Flowers*, &c. And againe, if the *Plant* be of *Nature*, to put forth *White Flowers* onely, and those not *thinne*, or *drie*, they are commonly of *rancke* and *fulsome Smell* ; As *May-Flowers*, and *White Lillies*.

508 Contrariwise, in *Berries*, the *White* is commonly more *Delicate*, and *Sweet* in *Taste*, than the *Coloured* ; As wee see in *White Grapes* ; In *White Raspes* ; In *White Strawberries* ; In *White Currans*, &c. The *Cause* is, for that the



the Coloured are more juyced, and courser jnyced; And therefore not so well and equally Concocted; But the *white* are better proportioned, to the Digestion of the Plant.

But in *Fruits*, the *white* commonly is meaner; As in *Peare-Plums*, *Damascins*, &c. And the Choicest *Plummes* are Blacke; The *Mulberrie*, (which though they call it a *Berry*, is a *Fruit*,) is better the Blacke, than the *white*. The *Harvest white-Plumme*, is a base *Plumme*; And the *Verdoccio* and *white Date-Plumme*, are no very good *Plummes*. The Cause is, for that they are all Overwarry: Whereas an higher Concoction is required for Sweetnesse, or Pleasure of Taste; And therefore all your dainty *Plummes*, are a little drie, and come from the Stone; As the *Muske-Plumme*, the *Damasin-Plumme*, the *Peach*, the *Apricot*, &c. Yet some *Fruits*, which grow not to be Blacke, are of the Nature of *Berries*, sweetest such as are *Paler*; As the *Cœur-Cherry*, which inclineth more to *white*, is sweeter than the *Red*; But the *Egriot* is more sowre.

Take *Gilly-Flower Seed*, of one kinde of *Gilly-Flower*: (As of the *Clove-Gilly-Flower*, which is the most Common;) And sow it; And there will come up *Gilly-Flowers*, some of one Colour, and some of another, casually, as the *Seed* meeteth with Nourishment in the Earth; So that the *Gardiners* finde, that they may have two or three *Roots* amongst an hundred, that are rare, and of great Price; As *Purple*, *Carnation* of severall *stripes*; The Cause is, (no doubt,) that in *Earth*, though it be contiguous, and in one Bed, there are very severall *Juyces*; And as the *Seed* doth casually meet with them, so it commeth forth. And it is noted especially, that those which do come up *Purple*, doe alwayes come up Single; The *Juyce*, as it seemeth, not being able to suffice a *Succulent Colour*, and a *Double Leaf*. This Experiment of severall Colours, comming up from one *Seed*, would bee tried also in *Larkes-Foot*, *Monkes-Hood*, *Poppey*, and *Hollyoke*.

Few *Fruits* are coloured *Red* within; The *Queene-Apple* is; And another *Apple*, called the *Rose-Apple*; *Mulberries* likewise; and *Grapes*, though most toward the *Skinne*. There is a *Peach* also, that hath a Circle of *Red* towards the Stone: And the *Egriot-Cherry* is somewhat *Red* within; But no *Peare*, nor *Warden*, nor *Plumme*, nor *Apricot*, although they have (many times) *Red* sides, are Coloured *Red* within. The Cause may be enquired.

The generall Colour of *Plants* is *Greene*; which is a Colour that no *Flower* is of. There is a *Greenish Prime-Rose*, but it is *Pale*, and scarce a *Greene*; The *Leaves* of some *Trees* turne a little *Murrie*, or *Reddish*; And they bee commonly *Young Leaves* that doe so; As it is in *Oakes*, and *Vines*, and *Hasle*. *Leaves* rot into a *Yellow*; And some *Hollies* have part of their *Leaves* *Yellow*, that are, (to all seeming,) as *Fresh* and *Shining*, as the *Greene*. I suppose also, that *Yellow* is a lesse *Succulent Colour*, than *Greene*; And a degree nearer *White*. For it hath beene noted, that those *Yellow Leaves* of *Holly* stand ever towards the *North*, or *North-East*. Some *Roots* are *Yellow*, as *Carrets*; And some *Plants* *Bloud-Red*, *Stalke* and *Leaf*, and all; As *Amaranibus*. Some *Herbes* incline to *Purple*, and *Red*; As a Kinde of *Sage* doth, and a Kinde of *Mint*, and *Rosa Solis*, &c. And some have *white Leaves*, as another Kinde of *Sage*, and another Kinde of *Mint*; But *Azure* and a *Faire Purple*, are never found in *Leaves*. This sheweth that *Flowers* are made of a refined *Juyce*, of the *Earth*; And so are *Fruits*: But *Leaves* of a more Course, and Common.

It is a *Curiosity* also to make *Flowers* *Double*; Which is effected by Often Removing them into *New Earth*; As on the contrary Part, *Double Flowers*,

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by neglecting, and not Removing, prove *Single*. And the Way to doe it speedily, is to sow or set *Seeds*, or *Slips of Flowers*; And as soone as they come up, to remove them into new Ground, that is good. Enquire also, whether *Inoculating of Flowers*, (as *Stock-Gilly-Flowers*, *Roses*, *Musk-Roses*, &c. doth not make them *Double*. There is a *Cherry-Tree*, that hath *Double Blossomes*: But that *Tree* beareth no *Fruit*; And, it may be, that the same Meanes, which applyed to the *Tree*, doth extremely accelerate the Sap to rise, and Breake forth; Would make the *Tree* spend it selfe in *Flowers*, and those to become *Double*; Which were a great pleasure to see; Especially in *Apple-Trees*, *Peach-Trees*, and *Almond-Trees*, that have *Blossomes Blush-Coloured*.

514

The *Making of Fruits without Core or Stone*, is likewise a *Curiositie*; And somewhat better: Because whatsoever maketh them so, is like to make them more Tender and Delicate. If a *Cions* or *Shoot*, fit to be set in the Ground, have the *Pith* finely taken forth, (and not altogether, but some of it left, the better to save the life, it will beare a *Fruit* with little, or no *Core*, or *Stone*. And the like is said to be, of dividing a *Quick-Tree* downe to the Ground, and Taking out the *Pith*, and then binding it up againe.

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It is reported also, that a *Cirron* grafted upon a *Quince*, will have small or no *Seeds*; And it is very probable, that any *Sowre-Fruit* grafted upon a *Stocke*, that beareth a *Sweeter Fruit* may both make the *Fruit* sweeter, and more void of the harsh Matter of *Kernels*, or *Seeds*.

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It is reported, that not onely the *Taking out of the Pith*, but the *Stopping of the Iuyce of the Pith*, from Rising in the Middest, and *Turning* it to rise on the Outside, will make the *Fruit* without *Core*, or *Stone*. As if you should boare a *Tree* cleane thorow, and put a wedge in. It is true, there is some Affinitie betweene the *Pith* and the *Kernell*, because they are both of a harsh Substance, and both placed in the Middest.

517

It is reported that *Trees watered* perpetually with *Warme Water*, will make a *Fruit*, with little or no *Core* or *Stone*. And the Rule is generall, that whatsoever will make a *Wilde-Tree*, a *Garden-Tree*, will make a *Garden-Tree* to have lesse *Core*, or *Stone*.

Experiments  
in Consort,  
touching the  
Degenerating  
of Plants;  
And of the  
Transmutation  
of them, one  
into another.

518

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THE Rule is certaine, that *Plants* for want of Culture, degenerate to be baser in the same Kinde; And sometimes so farre, as to change into another Kinde. 1. The *Standing long*, and not being *Removed*, maketh them degenerate. 2. *Drought*, unlessse the Earth of it selfe bee moist, doth the like. 3. So doth *Removing into worse Earth*, or *Forbearing to compost the Earth*; As wee see that *Water-Mint* turneth into *Field Mint*; And the *Colewort* into *Rape* by Neglect, &c.

Whatsoever *Fruit* useth to be set upon a *Root*, or a *Slip*, if it be sowne, will degenerate. *Grapes* sowne, *Figs*, *Almonds*, *Pomgranate Kernels* sowne; make the *Fruits* degenerate, and become *Wilde*. And againe, Most of those *Fruits* that use to be grafted, if they be set of *Kernels*, or *Stones*, degenerate. It is true, that *Peaches*, (as hath beene touched before,) doe better upon *Stones* set, than upon *Grafting*: And the Rule of Exception should seeme to be this; That whatsoever *Plant* requireth much Moisture, prospereth better upon the *Stone*, or *Kernell*, than upon the *Graft*. For the *Stocke*, though it giveth a finer Nourishment, yet it giveth a scantier, than the Earth at large.

520

*Seeds*, if they bee very Old, and yet have strength enough to bring forth a *Plant*, make the *Plant* degenerate. And therefore skilfull Gardiners make triall of the *Seeds*, before they buy them, whether they be good or no, by Putting them



them into Water gently Boyled ; And if they bee good, they will sprout within halfe an Houre.

It is strange which is reported, that *Basill* too much exposed to the *Sunne*, doth turne into *wilde Time*: Although those two *Herbs* seeme to have small Affinity ; but *Basill* is almost the onely Hot *Herbe*, that hath Fat and Succulent *Leaves* ; Which Oylinesse, if it be drawne forth by the *Sunne*, it is like it will make a very great Change.

521

There is an old Tradition, that *Boughs of Oake*, put into the Earth, will put forth *wilde Vines* : Which if it be true, (no doubt,) it is not the *Oake* that turneth into a *Vine*, but the *Oake-Bough* Putrifying, qualifieth the Earth, to put forth a *Vine* of it selfe.

522

It is not impossible, and I have heard it verified, that upon Cutting downe of an Old *Timber-Tree*, the *Stub* hath put out sometimes a *Tree* of another Kinde ; As that *Beech* hath put forth *Birch* ; Which, if it be true, the Cause may be, for that the old *Stub* is too scant of Juyce, to put forth the former *Tree* ; And therefore putteth forth a *Tree* of a smaller kinde, that needeth lesse Nourishment.

523

There is an Opinion in the Countrey, that if the same *Ground* be oft sown, with the *Graine* that grew upon it, it will, in the end, grow to bee of a baser kinde.

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It is certaine, that in very *Sterile Yeares*, *Corne* sowne will grow to an Other Kinde.

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*Grandia sepe quibus mandavimus Hordea Sulcis,  
Infelix Lolium, & steriles dominantur Avena.*

And generally it is a Rule, that *Plants* that are brought forth by *Culture*, as *Corne*, will sooner change into other *Species*, than those that come of themselves : For that *Culture* giveth but an Adventitious Nature, which is more easily put off.

This worke of the *Transmutation* of *Plants*, one into another, is inter *Magnalia Naturæ* : For the *Transmutation* of *Species* is, in the vulgar philosophy, pronounced Impossible : And certainly it is a thing of difficultie, and requireth deep Search into Nature : But seeing there appeare some manifest *Instances* of it, the Opinion of Impossibilitie is to bee rejected ; And the Meanes thereof to be found out. Wee see, that in *Living Creatures*, that come of *Putrefaction*, there is much *Transmutation*, of one into another ; As *Caterpillers* turne into *Flies*, &c. And it should seeme probable, that whatsoever *Creature*, having life, is generated without *Seed*, that *Creature* will change out of one *Species* into another. For it is the *Seed*, and the Nature of it, which locketh and boundeth in the *Creature*, that it doth not expatiate. So as we may well conclude, that seeing the Earth, of it selfe, doth put forth *Plants*, without *Seed*, therefore *Plants* may well have a *Transmigration* of *Species*. Wherefore wanting *Instances*, which doe occurre, wee shall give Directions of the most likely *Tryalls* : And generally, we would not have those,

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that read this Worke of *Sylva Sylvarum*, account it strange, or thinke that it is an Over-Haste, that we have set downe Particulars untried; For contrariwise, in our owne Estimation, wee account such Particulars, more worthy, than those that are already tried and knowne. For these Later must be taken as you finde them; But the Other doe levell Point blank at the *Inventing of Causes*, and *Axiomes*.

526

First, therefore you must make account, that if you will have one *Plant* change into another, you must have the *Nourishment* over-rule the *Seed*: And therefore you are to practise it by *Nourishments* as contrary, as may bee, to the *Nature* of the *Herbe*; So neverthelesse as the *Herb* may grow; And likewise with *Seeds* that are of the Weakest Sort, and have least Vigour. You shall doe well therefore, to take *Marsh-Herbs*, and Plant them upon Tops of Hills, and Champaignes; And such *Plants* as require much Moisture, upon Sandie and very drie Grounds. As for Example, *Marsh-Mallows*, and *Sedge*, upon Hills; *Cucumber* and *Lettuce-Seeds*, and *Coleworts*, upon a *Sandy Plot*: So contrariwise plant *Bushes*, *Heath*, *Ling*, & *Brakes*, upon a *Wet* or *Marsh Ground*. This I conceive also, that all *Esculent* and *Garden-Herbs*, set upon the Tops of Hills, will prove more *Medicinall*, though lesse *Esculent*, than they were before. And it may be likewise, some *Wilde Herbs* you may make *Sallet-Herbs*. This is the first Rule for *Transmutation of Plants*.

527

The second Rule shall bee to bury some few *Seeds*, of the *Herb* you would change, amongst other *Seeds*; And then you shall see, whether the Juyce of those other *Seeds*, doe not so qualifie the Earth, as it will alter the *Seed*, whereupon you worke. As for Example; Put *Parsley-Seed* amongst *Onion-Seed*; Or *Lettuce-Seed* amongst *Parsley-Seed*; Or *Basill-Seed* amongst *Thyme-Seed*; And see the Change of Taste, or otherwise. But you shall doe well, to put the *Seed* you would change, into a little linnen Cloth, that it mingle not with the forraine *Seed*.

528

The third Rule shall be, the *Making* of some *Medley* or *Mixture* of *Earth*, with some other *Plants* *Bruised*, or *Shaven*, either in *Leafe* or *Root*: As for Example, make *Earth* with a *Mixture* of *Colewort--Leaves* stamped, and set in it *Artichokes*, or *Parsnips*; So take *Earth* made with *Marjoram*, or *Origanum*, or *Wilde-Thyme*, bruised, or stamped, and set in it *Fennell-Seed*, &c. In which Operation, the Proesse of Nature still will be, (as I conceive,) not that the *Herbe* you worke upon, should draw the Juyce of the Forraine *Herbe*; (For that Opinion we have formerly rejected;) But that there will bee a New Confection of Mould, which perhaps will alter the *Seed*, and yet not to the kinde of the former *Herbe*.

529

The fourth Rule shall be, to marke what *Herbs*, some *Earths* doe put forth of themselves; And to take that *Earth*, and to Pot it, or to Vessell it; And in that to set the *Seed* you would change: As for Example, take from under Walls, or the like, where *Nettles* put forth in abundance, the *Earth* which you shall there finde, without any *String*, or *Root* of the *Nettles*; And Pot that *Earth*, and set in it *Stock-gilly-flowers*, or *Wall-Flowers*, &c. Or sow in the *Seeds* of them; And see what the Event will bee: Or take *Earth*, that you have prepared to put forth *Mushromes*, of it selfe, (whereof you shall finde some *Instances* following;) And sow in it *Purslane-Seed*, or *Lettuce-Seed*; for in these *Experiments*, it is likely enough, that the *Earth* being accustomed to send forth one Kinde of *Nourishment*, will alter the new *Seed*.

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The fifth Rule shall be, to make the *Herbe grow Contrary to his Nature*; As to make *Ground-Herbs* rise in *Height*: As for example; Carry *Camomill*, or *Wilde-Thyme*, or the *Greene-Strawberry*, upon Sticks, as you doe *Hops* upon Poles; And see what the Event will be.

530

The sixth Rule shall be, to make *Plants grow out of the Sunne, or open Aire*; For that is a great Mutation in Nature; And may induce a Change in the *Seed*: As barrell up *Earth*, and sow some *Seed* in it, and put in the Bottom of a Pond; Or put it in some great hollow *Tree*; Trie also the Sowing of *Seeds*, in the Bottomes of Caves; And Pots with *Seeds* sowne, hanged up in Wells, some distance from the Water, and see what the Event will be.

531

IT is certaine, that *Timber-Trees* in *Coppice-Woods*, grow more upright, and more free from Under-Boughs, than those that stand in the *Field*: The Cause whereof is, for that *Plants* have a Naturall Motion, to get to the Sunne; And besides, they are not glutted with too much Nourishment; For that the *Coppice* shareth with them; And Repletion ever hindereth Stature; Lastly, they are kept warme; And that ever in *Plants* helpeth Mounting.

Experiments in Confort, touching the *Procerity*, and *Lownesse*, and *Artificiall dwarfing* of *Trees*.

532

*Trees*, that are, of themselves, full of Heat, (which Heat appeareth by their *Inflammable Gums*), as *Firrs*, and *Pines*, mount of themselves in Height without Side-Boughs, till they come towards the Top. The Cause is, partly Heat; And partly Tenuity of Juyce; Both which send the Sap upwards. As for *Juniper*, it is but a *Shrub*, and groweth not bigge enough in Body, to maintaine a tall *Tree*.

533

It is reported, that a Good Strong *Canvas*, spread over a *Tree* grafted low, soone after it putteth forth, will *dwarfe* it, and make it spread. The Cause is plaine; For that all Things that grow, will grow as they finde Roome.

535

*Trees* are generally set of *Roots*, or *Kernells*; But if you set them of *Slips*, (as of some *Trees* you may, by name the *Mulberry*), some of the *Slips* will take; And those that take, (as is reported,) will be *Dwarfe-Trees*. The Cause is, for that a *Slip* draweth Nourishment more weakly, than either a *Root*, or *Kernell*.

536

All *Plants* that put forth their *Sap* hastily, have their Bodies not proportionable to their Length; And therefore they are *Winders*, and *Creepers*; As *Ivy*, *Briony*, *Hops*, *Woodbine*: Whereas *Dwarfing* requireth a slow Putting forth, and lesse Vigour of Mounting.

The Scripture saith, that *Salomon* wrote a *Naturall History*: from the *Cedar of Libanus*, to the *Mosse growing upon the Wall*: For so the best *Translations* have it. And it is true that *Mosse* is but the *Rudiment* of a *Plant*; And (as it were) the *Mould* of *Earth*, or *Barke*.

Experiments in Confort, touching the Rudiments of *Plants*, and of the Excrecences of *Plants*, or *Supper-Plants*.

537

*Mosse* groweth chiefly upon *Ridges* of *Houses*, tiled or thatched; And upon the *Crests* of *Walls*. And that *Mosse* is of a lightsome, and pleasant Green. The Growing upon *Slopes* is caused, for that *Mosse*, as on the one side it commeth of Moisture and water, so on the other side the *Water* must but Slide, and not stand or Poole. And the Growing upon *Tiles*, or *Walls*, &c. is caused, for that those dried *Earths*, having not Moisture sufficient to put forth a *Plant*, doe practise *Germination* by Putting forth *Mosse*; Though when by Age, or otherwise, they grow to relent and resolve, they

sometimes



sometimes put forth *Plants*; As *Wall-Flowers*. And almost all *Mosse* hath here and there little *Stalkes*, besides the low *Thrumme*.

538 *Mosse* groweth upon *Alleyes*, especially such as lie Cold, and upon the North; As in divers *Tarrasses*: And againe, if they be much trodden; Or if they were at the first, gravelled; For wheresoever *Plants* are kept downe, the Earth putteth forth *Mosse*.

539 Old Ground, that hath been long unbroken up, gathereth *Mosse*: And therefore Husbandmen use to cure their *Pasture Grounds*, when they grow to *Mosse*, by Tilling them for a yeare, or two: Which also dependeth upon the same Cause; For that the more Sparing and Starving Juyce of the Earth, insufficient for *Plants*, doth breed *Mosse*.

540 Old Trees are more *Mossie*, (farre) than Young; For that the Sap is not so franke as to rise all to the Boughes, but tyreth by the Way, and putteth out *Mosse*.

541 Fountaines have *Mosse* growing upon the Ground about them;  
*Muscoli Fomes*;

The Cause is, for that the Fountaines draine the Water from the Ground Adjacent, and leave but sufficient Moisture to breed *Mosse*: And besides, the Coldnesse of the Water conduceth to the same.

542 The *Mosse* of Trees, is a kinde of *Haire*; For it is the Juyce of the Tree, that is Excerned, and doth not Assimilate. And upon great Trees the *Mosse* gathereth a Figure, like a *Leafe*.

543 The Moistest Sort of Trees yeeld little *Mosse*; As we see in *Asps*, *Poplars*, *Willows*, *Beeches*, &c. Which is partly caused for the Reason that hath been given, of the francke Putting up of the Sap into the Boughes; And partly, for that the Barks of those Trees, are more Close, and Smooth, than those of Oakes, and *Asbes*; Whereby the *Mosse* can the hardlier issue out.

544 In Clay-Grounds, all Fruit-Trees grow full of *Mosse*, both upon Body and Boughes; Which is caused, partly by the Coldnesse of the Ground, whereby the *Plants* nourish lesse; And partly by the Toughnesse of the Earth, whereby the Sap is shut in, and cannot get up, to spread so franckly, as it should doe.

545 We have said heretofore, that if Trees be *Hide-bound*, they wax lesse Fruitfull, and gather *Mosse*: And that they are holpen by *Hacking*, &c. And therefore by the Reason of Contraries, if Trees bee bound in with Gords, or some Outward Bands, they will put forth more *Mosse*: Which (I thinke) happeneth to Trees that stand Bleake, and upon the Cold Winds. It would also be tried, whether, if you cover a Tree, somewhat thick upon the top, after his Powling, it will not gather more *Mosse*. I thinke also, the warring of Trees with Cold Fountaine Water, will make them grow full of *Mosse*.

546 There is a *Mosse* the Perfumers have, which commeth out of Apple-Trees, that hath an Excellent Sent. Quare particularly for the Manner of the Growth, and the Nature of it. And for this Experiments sake, being a Thing of Price, I have set down the last Experiments, how to multiply, and call on *Mosses*.

Next unto *Mosse*, I will speake of *Mushromes*; Which are likewise an *Vnperfect Plant*. The *Mushromes* have two strange Properties; The One, that they yeeld so Delicious a Meat; The other, that they come up so hastily; As in a Night; And yet they are *Vnsowne*. And therefore such as are Upstarts in State, they call



call, in reproach, *Mushromes*. It must needs bee therefore, that they be made of much *Moysture*; And that *Moisture* Fat, Grosse, and yet somewhat Concocted. And (indeed) wee finde, that *Mushromes* cause the *Accident*, which wee call *Incubus*, or the *Mare*, in the *Stomacke*. And therefore the *Surfet* of them may Suffocate, and Empoyson. And this sheweth, that they are Windy; And that Windinesse is Grosse, and Swelling; Not Sharp, or Griping. And upon the same reason *Mushromes* are a venereous Meat.

It is reported, that the *Barke* of *White*, or *Red Poplar*, (which are of the *Moistest* of *Trees*;) cut small, and cast into *Furrowes* well dunged, will cause the *Ground* to put forth *Mushromes*, at all *Seasons* of the *Yeare*, fit to be eaten. Some adde to the Mixture *Leaven* of *Bread*, resolved in *water*.

It is reported, that if a *Hilly-Field*, where the *Stubble* is standing, be set on *Fire*, in the *Showry Season*, it will put forth great *Store* of *Mushromes*.

It is reported, that *Harts-Horne*, *Shaven*, or in *Small Peeces*, mixed with *Dung*, and *waired*, putteth up *Mushromes*. And we know that *Harts-Horne* is of a *Fat* and *Clammie* Substance: And it may bee *Oxe-Horne* would doe the like.

It hath beene reported, though it be scarce credible, that *Ivy* hath growne out of a *Stags-Horne*; which they suppose did rather come from a *Confrication* of the *Horne* upon the *Ivy*, than from the *Horne* it selfe. There is not knowne any Substance, but *Earth*, and the *Precedures* of *Earth*, (as *Tile*, *Stone*, &c.) that yeeldeth any *Mosse*, or *Herby Substance*. There may bee *Triall* made of some *Seeds*, as that *Fennell-Seed*, *Mustard-Seed*, and *Rape-Seed*, put into some little *Holes*, made in the *Hornes* of *Stags*, or *Oxen*, to see if they will grow.

There is also another *Unperfect Plant*, that (in shew) is like a great *Mushrome*: And it is sometimes as broad as ones *Hat*; Which they call a *Toads-Stoole*: But it is not *Esculent*; And it groweth (commonly) by a dead *Stub* of a *Tree*; And likewise about the *Roots* of *Rotten-Trees*: And therefore seemeth to take his *Juyce* from *Wood Putrified*. Which sheweth, by the way, that *Wood Putrified* yeeldeth a franke *Moisture*.

There is a *Cake* that groweth upon the *Side* of a *Dead Tree*, that hath gotten no Name, but it is large, and of a *Chestnut Colour*, and hard, and pithy; Whereby it should seeme, that even *Dead Trees* forget not their *Putting forth*; No more than the *Carcasses* of *Mens Bodies* that put forth *Haire*, and *Nails*, for a *Time*.

There is a *Cod*, or *Bag*, that groweth commonly in the *Fields*; That at the first is hard like a *Tennis-Ball*, and white; And after groweth of a *Mushrome Colour*, and full of light *Dust* upon the *Breaking*: And is thought to be dangerous for the *Eyes*, if the *Powder* get into them; And to be good for *Kibes*. Belike it hath a *Corrosive*, and *Fretting Nature*.

There is an *Herb* called *Jewes-Eare*, that groweth upon the *Roots*, and *Lower Parts* of the *Bodies* of *Trees*; Especially of *Elders*, and sometimes *Asbes*. It hath a strange *Propertie*; For in *Warme Water*, it swelleth, and openeth extremely. It is not greene, but of a duskie browne Colour. And it is used for *Squinancies*, and *Inflammations* in the *Throat*; Whereby it seemeth to have a *Mollifying*, and *Lenifying Vertue*.

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There is a Kinde of *Spongie Excrecence*, which groweth chiefly upon the *Roots* of the *Laser-Tree*; And sometimes upon *Cedar*, and other *Trees*. It is very *White*, and *Light*, and *Friable*: Which we call *Agarick*. It is famous in *Physick* for the *Purging* of *Tough flegme*. And it is also an excellent *Opener* for the *Liver*: But *Offensive* to the *Stomacke*; And in *Taste* it is, at the first, *Sweet*, and after *Bitter*.

556

We finde no *Super-Plant*, that is a *Formed Plant*, but *Messelhoe*. They have an idle *Tradition*, that there is a *Bird*, called a *Missel-Bird*, that feedeth upon a *Seed*, which many times shee cannot digest, and so expelleth it whole with her *Excrement*: which falling upon a *Bow* of a *Tree*, that hath some *Rift*, putteth forth the *Misselhoe*. But this is a *Fable*; For it is not probable, that *Birds* should feed upon that they cannot digest. But allow that, yet it cannot be for other *Reasons*: For First, it is found but upon certain *Trees*; And those *Trees* beare no such *Fruit*, as may allure that *Bird* to sit, and feed upon them. It may be, that *Bird* feedeth upon the *Misselhoe-Berries*, and so is often found there; Which may have given occasion to the *Tale*. But that which maketh an *End* of the *Question*, is, that *Misselhoe* hath been found to put forth under the *Boughes*, and not (onely) above the *Boughes*: So it cannot be any *Thing* that falleth upon the *Bough*. *Misselhoe* groweth chiefly upon *Crab-Trees*, *Apple-Trees*, sometimes upon *Hawes*; And rarely upon *Oakes*; The *Misselhoe* whereof is counted very *Medicinall*. It is ever *greene*, *Winter* and *Summer*; And beareth a *White Glistering Berry*: And it is a *Plant*, utterly differing from the *Plant*, upon which it groweth. Two things therefore may be certainly set downe: First, that *Super-fetation* must be by *Abundance* of *Sap*, in the *Bough* that putteth it forth: Secondly, that that *Sap* must be such, as the *Tree* doth exerce, and cannot assimilate; For else it would goe into a *Bough*; And besides, it seemeth to be more *Fat* and *Unctuous*, than the *Ordinary Sap* of the *Tree*; Both by the *Berry*, which is *Clammie*; And by that it continueth *greene*, *Winter* and *Summer*, which the *Tree* doth not.

557

This *Experiment* of *Misselhoe* may give *Light* to other *Practices*. Therefore *Triall* would be made, by *Ripping* of the *Bough* of a *Crab-Tree*, in the *Barke*; And *Watriing* of the *Wound* every *Day*, with *Warne-water Dunged*, to see if it would bring forth *Misselhoe*, or any such like *Thing*. But it were yet more likely to trie it, with some other *Watriing* or *Anointing*, that were not so *Naturall* to the *Tree*, as *Water* is; As *Oyle*, or *Barme* of *Drinke*, &c. So they be such *Things* as kill not the *Bough*.

558

It were good to trie, what *Plants* would put forth, if they bee forbidden to put forth their *Naturall Boughes*: Poll therefore a *Tree*, and cover it, some thickness, with *Clay* on the *Top*; And see what it will put forth. I suppose it will put forth *Roots*; For so will a *Cions*, being turned downe into *Clay*: Therefore, in this *Experiment* also, the *Tree* would bee closed with somewhat, that is not so *Naturall* to the *Plant*, as *Clay* is. Trie it with *Leather*, or *Cloth*, or *Painting*, so it be not hurtfull to the *Tree*. And it is certaine, that a *Brake* hath beene knowne to grow out of a *Pollard*.

559

A *Man* may count the *Prickles* of *Trees* to be a kinde of *Excrecence*; For they will never be *Boughes*, nor beare *Leaves*. The *Plants* that have *Prickles*, are *Thornes*, blacke and white; *Brier*; *Rose*; *Limon-Trees*; *Crab-Trees*; *Goose-Berry*; *Berberie*; These have it in the *Bough*; The *Plants* that have *Prickles* in the *Leafe*, are; *Holly*; *Iuniper*; *Whin-bush*; *Thistle*; *Nettles* also have a small *Venomous Prickle*; So hath *Borrage*, but harmelesse. The *Cause* must be *Hastie Putting forth*; want of *Moisture*; And the *Closenesse* of the *Barke*; For the



the Haste of the Spirit to put forth, and the want of Nourishment to put forth a Bough, and the Closenesse of the Barke, cause Prickles in Boughes; And therefore they are ever like a Pyramis, for that the Moisture spendeth after a little Putting forth. And for Prickles in Leaves, they come also of Putting forth more Iuyce into the Lease, than can spread in the Lease smooth; and therefore the Leaves otherwise are Rough, as Borrage and Netiles are. As for the Leaves of Holly, they are Smooth, but never Plaine, but as it were with Folds, for the same Cause.

560

There be also Plants, that though they have no Prickles, yet they have a Kinde of Downey or Velvet Rine, upon their Leaves; As Rose-Campion, Stock-Gilly-Flowers, Colis-Foot; which Downe or Nap commeth of a Subtill Spirit, in a Soft or Fat Substance. For it is certaine, that both Stock-Gilly-Flower, and Rose-Campions, stamped, have been applyed, (with successe,) to the wrests of those that have had Tertian, or Quartan Agues; And the Vapour of Colts-Foot hath a Sanative vertue, towards the Lungs; And the Lease also is Healing in Surgery.

561

Another Kinde of Excrecence is an Exudation of Plants, joyned with Putrefaction; As wee see in Oake-Apples, which are found chiefly upon the Leaves of Oakes; And the like upon willowes: And Countrey People have a kind of Prediction, that if the Oake-Apple, broken, be full of wormes, it is a Signe of a Pestilent Yeare; Which is a likely Thing, because they grow of Corruption.

562

There is also upon Sweet, or other Byier, a fine Tuft, or Brush of Mosse, of divers Colours; Which if you cut, you shall ever finde full of little white wormes.

IT is certaine, that Earib taken out of the Foundations of Vaulis and Houses, and Bottomes of Wells, and then put into Pots, will put forth Sundry Kinds of Herbs: But some Time is required, for the Germination; For if it bee taken, but from a Faibome deep, it will put forth the First Yeare; If much deeper, not till after a Yeare, or Two.

Experiments  
in Confort,  
touching the  
Producing of  
Perfect Plants  
without Seed.

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The Nature of the Plants growing out of Earib so taken up, doth follow the Nature of the Mould it selfe; As if the Mould bee Soft, and Fine, it putteth forth Soft Herbs; As Grasse, Plantaine, and the like; If the Earib bee Harder and Courser, it putteth forth Herbs more Rough, as Thistles, Firres, &c.

565

It is Common Experience, that where Alleyes are close Gravelled, the Earib putteth forth, the first yeare, Knot-Grasse, and after Spire-Grasse. The Cause is, for that the Hard Gravell, or Pebble at the first Laying, will not suffer the Grasse to come forth upright, but turneth it so finde his way where it can; But after that the Earib is somewhat loosened at the Top, the Ordinary Grasse commeth up.

566

It is reported, that Earib, being taken out of Shady and Warry Woods, some depth, and Potted, will put forth Herbs of a Fat and Juicie Substance; As Penny-wort, Purslane, Houseeke, Penny-royall, &c.

567

The Water also doth send forth Plants, that have no Roots fixed in the Bottome; But they are lesse Perfect Plants, being almost but Leaves, and those Small ones: Such is that we call Duck-weed; Which hath a Lease no bigger than a Thyme-Leaf, but of a fresher Greene, and putteth forth a little String into the water, farre from the Bottome. As for the Water-Lilly, it hath a Root in the Ground: And so have a Number of other Herbs that grow in Ponds.

It



568

It is reported by some of the *Ancients*, and some *Moderne Testimonie* likewise, that there be some *Plants*, that grow upon the Top of the *Sea*; Being supposed to grow of some *Concretion* of *Slime* from the *Water*, where the *Sunne* beateth hot, and where the *Sea* stirreth little. As for *Alga Marina*, (*Sea-weed*), and *Eryngium* (*Sea-Thistle*), both have *Roots*; but the *Sea-weed* under the *Water*, the *Sea-Thistle* but upon the *Shore*.

569

The *Ancients* have noted, that there are some *Herbs*, that grow out of *Snow*, laid up close together, and *Putrified*; And that they are all *Bitter*; And they name one especially, *Flomus*, which we call *Moth-Mullein*. It is certain, that *Wormes* are found in *Snow* commonly, like *Earth-Wormes*; And therefore it is not unlike, that it may likewise put forth *Plants*.

570

The *Ancients* have affirmed, that there are some *Herbs*, that grow out of *Stone*; Which may be, for that it is certaine, that *Toads* have beene found in the Middle of a *Free-Stone*. We see also, that *Flints*, lying above *Ground*, gather *Mosse*; And *Wall-Flowers*, and some other *Flowers*, grow upon *Walls*; But whether upon the *Maine Bricke*, or *Stone*, or whether out of the *Lime*, or *Chincks*, is not well observed; For *Elders* and *Ashes* have beene seene to grow out of *Steeple*s: But they manifestly grow out of *Clefts*; In so much as when they grow bigge, they will dis-joyne the *Stone*. And besides, it is doubtfull, whether the *Mortar* it selfe putteth it forth, or whether some *Seeds* be not let fall by *Birds*. There be likewise *Rock-Herbs*; But I suppose those are, where there is some *Mould* or *Earth*. It hath likewise been found, that great *Trees* growing upon *Quarries*, have put downe their *Root* into the *Stone*.

571

In some *Mines* in *Germany*, as is reported, there grow in the *Bottom* *Vegetables*; And the *Worke-Folks* use to say, they have *Magickall Vertue*; And will not suffer men to gather them.

572

The *Sea-Sands* seldome beare *Plants*. Whereof the *Cause* is yeilded, by some of the *Ancients*, for that the *Sunne* exhalet the *Moisture*, before it can incorporate with the *Earth*, and yeeld a *Nourishment* for the *Plant*. And it is affirmed also, that *Sand* hath (alwayes) his *Root* in *Clay*; And that there be no *Veines* of *Sand*, any great depth within the *Earth*.

573

It is certaine, that some *Plants* put forth for a time, of their owne *Store*, without any *Nourishment* from *Earth*, *Water*, *Stone*, &c. Of which *Vide* the *Experiment 29*.

Experiments  
in Confort,  
touching  
Forraine  
Plants.

574

It is reported, that *Earth*, that was brought out of the *Indies*, and other *Remote Countreies*, for *Ballast* of *Ships*, cast upon some *Grounds* in *Italy*, did put forth *Forraine Herbs*, to us in *Europe* not knowne; And, that which is more, that of their *Roots*, *Barks*, and *Seeds*, confused together, and mingled with other *Earth*, and well *Watred* with *Warmed Water*; there came forth *Herbs*, much like the Other.

575

*Plants* brought out of *Hot Countreies*, will endeavour to put forth, at the same *Time*, that they usually doe in their owne *Climate*; And therefore to preserve them, there is no more required, than to keep them from the *Injury* of *Putting back* by *Cold*. It is reported also, that *Graine* out of the *Hotter Countreies* translated into the *Colder*, will be more forward, than the *Ordinary Graine* of the *Cold Countrey*. It is likely, that this will prove better in *Graines*, than in *Trees*; For that *Graines* are but *Annually*; And so the *Vertue* of the *Seed* is not worne out; Whereas in a *Tree*, it is embased by the *Ground*, to which it is *Removed*.

576

Many *Plants*, which grow in the *Hotter Countreies*, being set in the *Colder*,



der, will neverthelesse, even in those *Cold Countries*, being sowne of *Seeds* late in the *Spring*, come up and abide most part of the *Summer*; As wee finde it in *Orenges*, and *Limon-Seeds*, &c. The *Seeds* whereof sowne in the End of *April*, will bring forth excellent *Sallets*, mingled with other *Herbs*. And I doubt not, but the *Seeds* of *Clove-Trees*, and *Pepper-Seeds*, &c. if they could come hither *Greene* enough to be sowne, would doe the like.

**T**Here be some *Flowers*, *Blossomes*, *Graines*, and *Fruits*, which come more *Early*; And others which come more *Late* in the *Yeare*. The *Flowers* that come early, with us, are; *Prime-Roses*, *Violets*, *Anemonies*, *Water-Daffadillies*, *Crocus Vernus*, and some early *Tulippa's*. And they are all *Cold Plants*; Which therefore, (as it should seeme,) have a quicker *Perception* of the *Heat* of the *Sunne* Increasing, than the *Hot Herbs* have; As a *Cold Hand* will sooner finde a little *Warmth*, than a *Hot*. And those that come next after, are *Wall-Flowers*, *Cowslips*, *Hyacinths*, *Rosemary-Flowers*, &c. And after them, *Pinks*, *Roses*, *Flowerdeluces*, &c. and the latest are *Gilly-Flowers*, *Holly-Oakes*, *Larkes-Foot*, &c. The *Earliest Blossomes* are, the *Blossomes* of *Peaches*, *Almonds*, *Cornelians*, *Mezerions*, &c. And they are of such *Trees*, as have much *Moisture*, either *Watty*, or *Oily*. And therefore *Crocus Vernus* also, being an *Herbe*, that hath an *Oylie Iuyce*, putteth forth early. For those also finde the *Sunne* sooner than the *Drier Trees*. The *Graines* are, first *Rie* and *Wheat*; Then *Oats* and *Barley*; Then *Pease* and *Beanes*. For though *Greene Pease* and *Beanes* be eaten sooner, yet the *Drie Ones*, that are used for *Horse-Meat*, are ripe last; And it seemeth that the *Fatter Graine* commeth first. The *Earliest Fruits* are, *Strawberries*, *Cherries*, *Gooseberries*, *Corrans*; And after them *Early Apples*, *Early Peares*, *Apricots*, *Rasps*; And after them, *Damasins*, and most *Kinde of Plums*, *Peaches*, &c. And the latest are *Apples*, *Wardens*, *Grapes*, *Nuts*, *Quinces*, *Almonds*, *Sloes*, *Brier-berries*, *Heps*, *Medlars*, *Services*, *Cornelians*, &c.

It is to be noted, that (commonly) *Trees* that ripen latest, *Blossome* soonest: As *Peaches*, *Cornelians*, *Sloes*, *Almonds*, &c. And it seemeth to be a *Work* of *Providence*, that they blossome so soone; For otherwise, they could not have the *Sunne* long enough to ripen.

There be *Fruits*, (but rarely, that come twice a *Yeare*; as some *Peares*, *Strawberries*, &c. And it seemeth they are such as abound with *Nourishment*; Whereby after one *Period*, before the *Sunne* waxeth too weake, they can endure another. The *Violet* also, amongst *Flowers*, commeth twice a *Yeare*; Especially the *Double White*; And that also is a *Plant* full of *Moisture*. *Roses* come twice, but it is not without *Cutting*, as hath beene formerly said.

In *Muscovia*, though the *Corne* come not up, till late *Spring*, yet their *Harvest* is as *Early* as *Ours*. The *Cause* is, for that the *Strength* of the *Ground* is kept in with the *Snow*; And wee see with us, that if it be a long *Winter*, it is commonly a more *Plentifull Yeare*: And after those kinde of *Winters* likewise, the *Flowers*, and *Corne*, which are *Earlier*, and *Later*, doe come commonly at once, and at the same time; Which troubleth the *Husbandman* many times; For you shall have *Red-Roses*, and *Damaske Roses*, come together; And likewise the *Harvest* of *Wheat* and *Barley*. But this happeneth ever, for that the *Earlier* stayeth for the *Later*; And not that the *Later* commeth sooner.

There be divers *Fruit-Trees*, in the *Hot Countries*, which have *Blossomes*, and *Young Fruit*, and *Ripe Fruit*, almost all the *Yeare*, succeeding one another. And it is said, the *Orenges* hath the like with us, for a great Part of *Summer*;

Experiments  
in Consort,  
touching the  
Seasons in  
which Plants  
come forth.

577

578

579

580

581



Summer; And so also hath the *Figge*. And no doubt, the *Naturall Motion* of *Plants*, is to have so; But that either they want *Iuyce* to spend; Or they meet with the *Cold* of the *Winter*: And therefore this *Circle* of *Ripening* cannot be, but in *Succulent Plants*, and *Hot Countreies*.

582

Some *Herbs* are but *Annually*, and die, *Root* and all, once a *Yeare*; As *Borage*, *Lettuce*, *Cucumbers*, *Muske-Melons*, *Basill*, *Tobacco*, *Mustard-Seed*, and all kindes of *Corne*; Some continue many *Yeares*, As *Hyssope*, *Germander*, *Lavender*, *Fennell*, &c. The *Cause* of the *Dying* is double; The first is the *Tender-nesse* and *Weaknesse* of the *Seed*, which maketh the *Period* in a small time; As it is in *Borage*, *Lettuce*, *Cucumbers*, *Corne*, &c. And therefore none of these are *Hot*. The other *Cause* is, for that some *Herbs* can worse endure *Cold*; As *Basill*, *Tobacco*, *Mustard-Seed*. And these have (all) much *Heat*.

Experiments  
in Confort,  
touching the  
Lasting of  
Herbs and  
Trees.

583

**T**he *Lasting* of *Plants* is most in those that are *Largest* of *Body*; As *Oaks*, *Elme*, *Chest-Nut*, the *Loat-Tree*, &c. And this holdeth in *Trees*; But in *Herbs* it is often contrary; For *Borage*, *Colewort*, *Pompions*, which are *Herbs* of the *Largest Size*, are of small *Durance*; Whereas *Hyssope*, *Winter-Savory*, *Germander*, *Thyme*, *Sage*, will last long. The *Cause* is, for that *Trees* last according to the *Strength*, and *Quantity* of their *Sap* and *Iuyce*; Being well munited by their *Barke* against the *Injuries* of the *Aire*: But *Herbs* draw a *Weak Iuyce*; And have a soft *Stalke*; And therefore those amongst them which last longest, are *Herbs* of *Strong Smell*, and with a *Sticke Stalke*.

584

*Trees* that beare *Mast*, and *Nuts*, are commonly more lasting, than those that beare *Fruits*; Especially the *Moister Fruits*: As *Oakes*, *Beeches*, *Chestnuts*, *Wall-nuts*, *Almonds*, *Pine-Trees*, &c. last longer than *Apples*, *Pears*, *Plums*, &c. The *Cause* is the *Fatnesse* and *Oyliness* of the *Sap*; Which ever wasteth lesse, than the more *Watry*.

585

*Trees*, that bring forth their *Leaves* late in the *Yeare*, and cast them likewise late are more lasting, than those that sprout their *Leaves* Early, or shed them betimes. The *Cause* is, for that the late *Comming forth* sheweth a *Moisture* more fixed; And the other more loose, and more easily resolved. And the same *Cause* is, that *Wilde-Trees* last longer than *Garden-Trees*; And in the same kinde, those whose *Fruit* is *Acide*, more than those whose *Fruit* is *sweet*.

586

Nothing procureth the *Lasting* of *Trees*, *Bushes*, and *Herbs*, so much, as often *Cutting*: For every *Cutting* causeth a *Renovation* of the *Iuyce* of the *Plant*; That it neither goeth so farre, nor riseth so faintly, as when the *Plant* is not *Cut*: Insomuch as *Annually Plants*, if you cut them seasonably, and will spare the use of them, and suffer them to come up still young, will last more *Yeares* than one; As hath beene partly touched; Such as is *Lettuce*, *Purslane*, *Cucumber*, and the like. And for *Great Trees*, we see almost all *Overgrowne-Trees*, in *Church-yards*, or neare *Ancient Buildings*, and the like, are *Pollards*, or *Dottards*, and not *Trees* at their full *Height*.

587

Some *Experiment* would be made, how by *Art* to make *Plants* more *Lasting*, than their ordinary *Period*; As to make a *Stalke* of *Wheate*, &c. last a whole *yeare*. You must ever presuppose, that you handle it so, as the *Winter* killeth it not; For we speake onely of *Prolonging* the *Naturall Period*. I conceive, that the *Rule* will hold; That whatsoever maketh the *Herbe* come later, than at his time, will make it last longer time: It were good to trie it, in a *Stalke* of *wheat*, &c. set in the *Shade*, and encompassed with a *Case* of *wood*, not touching the *Stram*, to keep out open *Aire*.

As for the *Preservation* of *Fruits*, and *Plants*, as well upon the *Tree*, or *Stalk*,



as gathered, we shall handle it under the Title of Conservation of Bodies.

**T**He Particular Figures of Plants we leave to their Descriptions, But some few Things, in generall, we will observe. Trees and Herbs, in the Growing forth of their Boughs, and Branches, are not Figured, and keepe no Order. The Cause is, for that the Sap, being restrained in the Rinde, and Barke, breaketh not forth at all; (As in the Bodies of Trees, and Stalkes of Herbs, till they begin to branch; And then, when they make an Eruption, they breake forth casually, where they finde best way, in the Barke, or Rinde. It is true, that some Trees are more scattered in their Boughes; As Sallow-Trees, Warden-Trees, Quince-Trees, Medlar-Trees, Limon-Trees, &c. Some are more in the forme of a Pyramis, and come almost to todd; As the Peare-Tree, (which the Criticks will have to borrow his name of  $\pi\pi\rho$ , Fire,) Orange-Trees, Firre-Trees, Service-Trees, Lime-Trees, &c. And some are more spread and broad; As Beeches, Hornebeame, &c. The rest are more indifferent. The Cause of Scattering the Boughes, is the Hasty breaking forth of the Sap; And therefore those Trees rise not in a Body of any Height, but branch neare the Ground. The Cause of the Pyramis, is the Keeping in of the Sap, long before it branch; And the spending of it when it beginneth to branch, by equall degrees. The Spreading is caused by the Carrying up of the Sap, plentifully, without Expende; And then putting it forth speedily, and at once.

There be divers Herbs, but no Trees, that may be said to have some kinde of Order, in the Putting forth of their Leaves: For they have Ioynts, or Knuckles, as it were Stops in their Germination; As have Gilly-Flowers, Pinks, Fennell, Corne, Reeds, and Canes. The Cause whereof is, for that the Sap ascendeth unequally, and doth (as it were) tire and stop by the way. And it seemeth, they have some Closenesse, and Hardnesse in their Stalke, which hindreth the Sap from going up, untill it hath gathered into a Knot, and so is more urged to put forth. And therefore, they are most of them hollow, when the Stalke is drie. As Fennell-Stalke, Stubble, and Canes.

Flowers have (all) exquisite Figures; And the Flower-Numbers are (chiefly) Five, and Four; As in Prime-Roses, Bryer-Roses, Single Musk-Roses, Single-Pinks, and Gilly-Flowers, &c. which have five Leaves: Lillies, Flower-de-luces, Borage, Buglosse, &c. which have foure Leaves. But some put forth Leaves not Numbered; But they are ever small Ones; As Mary-Golds, Trifoile, &c. Wee see also, that the Sockets, and Supporters of Flowers, are Figured; As in the Five Brethren of the Rose; Sockets of Gilly-Flowers, &c. Leaves also are all Figured; Some Round; Some long; None Square; And many jagged on the Sides; Which Leaves of Flowers seldome are. For I account the Tagging of Pinks, and Gilly-Flowers, to be like the inequalitie of Oak-Leaves, or Vine-Leaves, or the like; But they seldome or never have any small Purles.

**O**F Plants, some few put forth their Blossomes before their Leaves; As Almonds, Peaches, Cornelians, Black-Thorne, &c. But most put forth some Leaves before their Blossomes; As Apples, Pears, Plums, Cherries, White-Thorn, &c. The Cause is, for that those, that put forth their Blossomes first, have either an Acute and Sharp Spirit; (And therefore commonly they all put forth early in the Spring, and ripen very late; As most of the Particulars before mentioned;) Or else an Oylie Iuyce, which is apter to put out Flowers, than Leaves.

Of Plants, some are Greene all Winter; Others cast their Leaves. There are Greene all Winter; Holly, Ivy, Box, Firre, Engh, Cypressse, Juniper, Bayes, Rose-Mary, &c. The Cause of the Holding Greene, is the Close and Compact Sub-

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stance

Experiments  
in Consort,  
touching the  
severall Fi-  
gures of  
Plants.

588

589

590

Experiments  
in Consort,  
touching some  
Principall  
Differences in  
Plants.

591

592



stance of their *Leaves*, and the *Pedicles* of them. And the *Cause* of that againe, is either the *Tough* and *Viscous Iuyce* of the *Plant*; Or the *Strength* and *Heat* thereof. Of the first Sort is *Holly*; Which is of so *Viscous a Iuyce*, as they make *Birdlime* of the *Barke* of it. The *Stalke* of *Ivy* is *Tough*, and not *Fragile*, as wee see in other small *Twigs* drie. *Firre* yeeldeth *Pitch*. *Box* is a fast and heavy *Wood*, as we see it in *Boules*. *Eugh* is a *Strong* and *Tough Wood*, as we see it in *Bowes*. Of the Second Sort is *Iuniper*, which is a *Wood* *Odorate*, and maketh a hot *Fire*. *Bayes* is like-wise a *Hot* and *Aromaticall Wood*; And so is *Rose-Mary* for a *Shrub*. As for the *Leaves*, their *Densitie* appeareth, in that, either they are *Smooth* and *Shining*, as in *Bayes*, *Holly*, *Ivie*, *Box*, &c. Or in in that they are *Hard* and *Spirie*, as in the rest. And *Triall* would bee made of *Grafting* of *Rose-Mary*, and *Bayes*, and *Box*, upon a *Holly-Stocke*; Because they are *Plants* that come 'all *Winter*. It were good to trie it also with *Grafts* of other *Trees*, either *Fruit-Trees*, or *Wilde Trees*; To see whether they will not yeeld their *Fruit*, or beare their *Leaves*, later, and longer in the *Winter*; because the *Sap* of the *Holly* putteth forth most in the *Winter*. It may bee also a *Mezerion-Tree*, grafted upon a *Holly*, will prove both an *Earlier*, and a *Greater Tree*.

593

There be some *Plants*, that beare no *Flower*, and yet beare *Fruit*: There be some, that beare *Flowers*, and no *Fruit*: There be some, that beare neither *Flowers*, nor *Fruit*. Most of the great *Timber-Trees*, (as *Oakes*, *Beeches*, &c.) beare no apparent *Flowers*: Some few (likewise) of the *Fruit-Trees*; As *Mulberry*, *Walnut*, &c. And some *Sbrubs*, (as *Iuniper*, *Holly*, &c.) beare no *Flowers*. Divers *Herbs* also beare *Seeds*, (which is as the *Fruit*;) and yet beare no *Flowers*; As *Purslane*, &c. Those that beare *Flowers*, and no *Fruit*, are few; As the *Double Cherry*, the *Sallow*, &c. But for the *Cherry*, it is doubtfull, whether it be not by *Art*, or *Culture*; For if it bee by *Art*, then *Triall* would be made, whether *Apples*, and other *Fruits* *Blasfomes*, may not be doubled. There are some Few, that beare neither *Fruit*, nor *Flower*; As the *Elme*, the *Poplars*, *Box*, *Brakes*, &c.

594

There be some *Plants*, that shoot still upwards, and can *Support* themselves; As the greatest Part of *Trees*, and *Plants*: There be some Other, that *Creep* along the *Ground*; Or *Winde* about other *Trees*, or *Props*, and cannot support themselves; As *Vines*, *Ivie*, *Briar*, *Briony*, *Wood-bines*, *Hop's*, *Climatis*, *Camomill*, &c. The *Cause* is, (as hath beene partly touched,) for that all *Plants*, (naturally) move upwards; But if the *Sap* put up too fast, it maketh a slender *Stalke*, which will not support the weight: And therefore these latter Sort are all *Swift* and *Hastie Commers*.

Experiments  
in Confort,  
touching all  
Manner of  
Composts, and  
Helps of  
Ground.

595

THE first and most Ordinary *Helpe* is *Stercoration*. The *Sheeps-Dung* is one of the best; And next, the *Dung* of *Kine*: And thirdly, that of *Horses*: Which is held to be somewhat too hot, unlesse it be mingled. That of *Pigeons* for a *Garden*, as a small *Quantity* of *Ground*, *Excelleth*. The *Ordering* of *Dung* is; If the *Ground* be *Arable*, to spread it immediately before the *Ploughing* and *Sowing*; And so to *Plough* it in: For if you spread it long before, the *Sunne* will draw out much of the *Fainesse* of the *Dung*: If the *Ground* be *Grazing Ground*, to spread it somewhat late, towards *Winter*; That the *Sunne* may have the lesse *Power* to drie it up. As for speciall *Composts* for *Gardens*, (as a *Hot Bed*, &c. (we have handled them before.

596

The Second Kind of *Compost*, is, the *Spreading* of divers *Kinds* of *Earth*; As *Marle*, *Chalke*, *Sea-Sand*, *Earth* upon *Earth*, *Pond-Earth*; And the *Mixtures* of them. *Marle* is thought to be the best; As having most *Fainesse*; And not  
Heating



Heating the *Ground* too much. The next is *Sea-Sand*; Which (no doubt) obtaineth a speciall Vertue, by the *Salt*: For *Salt* is the first Rudiment of life. *Chalke* over-heateth the *Ground* a little. And therefore is best upon *Cold Clay-Grounds*, or *Moist Grounds*: But I heard a great *Husband* say, that it was a common Errour, to think that *Chalke* helpeth *Arable Grounds*, but helpeth not *Grazing Grounds*; Whereas (indeed) it helpeth *Grasse*, as well as *Corne*: but that which breedeth the Errour is, because after the *Chalking* of the *Ground*, they weare it out with many *Crops*, without Rest; And then (indeed) afterwards it will beare little *Grasse*, because the *Ground* is tyred out. It were good to trie the laying of *Chalke* upon *Arable Grounds*, a little while before *Ploughing*; And to *Plough* it in, as they doe the *Dung*; But then it must bee *Friable* first, by *Raine*, or *Lying*: As for *Earth*, it *Compasseth* it Selfe; For I knew a *Great Garden*, that had a *Field* (in a manner) powred upon it; And it did beare *Fruit* excellently the first yeare of the *Planting*: For the *Surface* of the *Earth* is ever the *Fruitfullest*. And *Earth* so prepared hath a double *Surface*. But it is true, as I conceive, that such *Earth*, as hath *Salt-Petre* bred in it, if you can procure it without too much charge, doth excell. The way to hasten the *Breeding* of *Salt-Petre*, is to forbid the *Sunne*, and the *Growth* of *Vegetables*. And therefore, if you make a large *Hovell*, thatched, over some Quantity of *Ground*; Nay, if you doe but *Planck* the *Ground* over, it will breed *Salt-Petre*. As for *Pond-Earth*, or *River-Earth*, it is a very good *Compost*; Especially if the *Pond* have beene long uncleaned, and so the *water* be not too *Hungry*: And I judge it will be yet better, if there bee some *Mixture* of *Chalke*.

The Third *Helpe* of *Ground*, is, by some other *Substances*, that have a *Vertue* to make *Ground* Fertile; though they bee not meere *Earth*: wherein *Asbes* excell; In so much as the *Countries* about *Aetna*, and *Vesuvius*, have a kinde of *Amends* made them, for the *Mischiefe* the *Eruptions* (many times) doe, by the exceeding *Fruitfulnesse* of the *Soile*, caused by the *Asbes*, scattered about. *Soot* also, though thinne spread, in a *Field* or *Garden*, is tried to bee a very good *Compost*. For *Salt*, it is too *Costly*: But it is tried, that mingled with *Seed-Corne*, and sown together, it doth good: And I am of *Opinion*, that *Chalke* in *Powder*, mingled with *Seed-Corne*, would doe good; Perhaps as much as *Chalking* the *Ground* all over. As for the *Steeping* of the *Seeds*, in severall *Mixtures* with *Water*, to give them *Vigour*; Or *Warring* *Grounds* with *Compost-Water*; We have spoken of them before.

The Fourth *Helpe* of *Ground*, is, the *Suffering* of *Vegetables* to die into the *Ground*; And so to *Fatten* it; As the *Stubble* of *Corne*, Especially *Pease*. *Brakes* cast upon the *Ground*, in the beginning of *Winter*, will make it very *Fruitfull*. It were good (also) to trie, whether *Leaves* of *Trees* swept together, with some *Chalke* and *Dung* mixed, to give them more *Heart*, would not make a good *Compost*: For there is nothing lost, so much as *Leaves* of *Trees*; And as they lie scattered, and without *Mixture*, they rather make the *Ground* *soure*, than otherwise.

The Fifth *Help* of *Ground*, is *Heat* and *Warmth*. It hath been anciently practised to burne *Heath*, & *Ling*, and *Sedge*, with the vantage of the *Winde*, upon the *Ground*: Wee see, that *Warmth* of *Walls* and *Enclosures*, mendeth *Ground*: Wee see also that *Lying* open to the *South*, mendeth *Ground*: Wee see againe, that the *Foldings* of *Sheepe* helpe *Ground*, as well by their *Warmth*, as by their *compost*: And it may be doubted, whether the *Covering* of the *Ground* with *Brakes*, in the Beginning of the *Winter*, (whereof we spake in the last *Experiment*,) helpeth it not, by reason of the *Warmth*. Nay some very good



600

Husbands doe suspect, that the Gaibering up of *Flints*, in *Flinty Ground*, and Laying them on *Heaps*, (which is much used,) is no good Husbandry; For that they would keepe the *Ground Warme*.

The Sixth *Helpe* of *Ground* is, by *Watering* and *Irrigation*; which is in two *Manners*: The one by *Letting in*, and *Shutting out Waters*, at seasonable *Times*: For *Water*, at some *Seasons*, and with reasonable stay, doth good; But at some other *Seasons*, and with too long *Stay*, doth hurt. And this serveth onely for *Meadows*, which are along some *River*. The other way is, to bring *Water*, from some *Hanging Grounds*, where there are *Springs*, into the *Lower Grounds*, carrying it in some long *Furrowes*; And from those *Furrowes*, drawing it traaverse to spread the *Water*. And this maketh an excellent *Improvement*, both for *Corne*, and *Grasse*. It is the richer, if those *Hanging Grounds* be fruitfull, because it washeth off some of the *Fatnesse* of the *Earth*: But howsoever it profiteth much. Generally, where there are great *Overflows*, in *Fens*, or the like, the drowning of them in the *Winter*, maketh the *Summer* following more fruitfull: The *Cause* may be, for that it keepeth the *Ground warme*, and nourisheth it: But the *Fen-Men* hold, that the *Sewers* must be kept so, as the *Water* may not stay too long in the *Spring*, till the *Weeds* and *Sedge* begrowne up; For then the *Ground* will bee like a *Wood*, which keepeth out the *Sunne*; And so continueth the *Wet*; Whereby it will never *graze* (to purpose) that yeare. Thus much for *Irrigation*. But for *Avoidances*, and *Drainings* of water, where there is too much, and the *Helps* of *Ground* in that kinde, wee shall speake of them in another *Place*.

NATU-





# NATVRALL HISTORIE.

## VII. Century.

**T**He Differences betweene *Animate* and *Inanimate Bodies*, we shall handle fully under the Title of *Life*, and *Living Spirits*, and *Powers*. We shall therefore make but a brieft Mention of them in this Place. The Main Differences are two. All *Bodies* have *Spirits*, and *Pneumaticall Parts* within them: But the Main Differences betweene *Animate* and *Inanimate*, are two: The first is, that the *Spirits* of *Things Animate*, are all Continued with themselves, and are Branched in *Veines*, and secrete *Canales*, as *Bloud* is: And in *Living Creatures*, the *Spirits* have not onely *Branches*, but certaine *Cells* or *Seats*, where the *Principall Spirits* doe reside, and whereunto the rest doe resort: But the *Spirits* in *Things Inanimate* are shut in, and cut off by the *Tangible Parts*; And are not pervious one to another; As *Aire* is in *Snow*. The second Main Difference is, that the *Spirits* of *Animate Bodies* are all in some degree, (more or lesse,) kindled and inflamed; And have a fine Commixture of *Flame*, and an *Aëriall Substance*. But *Inanimate Bodies* have their *Spirits* no whit Inflamed, or Kindled. And this Difference consisteth not in the *Heat* or *Coolenesse* of *Spirits*; For *Cloves* and other *Spices*, *Naptha* and *Petroleum*, have exceeding *Hot Spirits*, (hotter a great deale than *Oile*, *Waxe*, or *Tallow*, &c.) but not Inflamed. And when any of those *Weake* and *Temperate Bodies* come to bee Inflamed, then they gather a much greater *Heat*, than others have *Uninflamed*; besides their *Light*, and *Motion*, &c.

The Differences, which are *Secondary*, and proceed from these two *Radicall Differences*, are; First, *Plants* are all *Figurate* and *Determinate*, which *Inanimate Bodies* are not; For looke how farre the *Spirit* is able to *Spread* and *Continue* it selfe; So farre goeth the *Shape*, or *Figure*; And then is determined. Secondly, *Plants* doe nourish; *Inanimate Bodies* doe not: They have an *Accretion*, but no *Alimentation*. Thirdly, *Plants* have a *Period* of *Life*; which *Inanimate Bodies* have not. Fourthly, they have a *Succession*, and *propagation* of their *Kinde*; which is not in *Bodies Inanimate*.

Experiments  
in Confort,  
touching the  
*Affinities*, and  
Differences, be-  
tween *Plants*  
and *Inanimate*  
*Bodies*.

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The Differences between *Plants*, and *Metals* or *Fossiles* besides those four before mentioned, (For *Metals* I hold Inanimate,) are these: First, *Metals* are more *Durable* than *Plants*: Secondly, they are more *Solid* and *Hard*: Thirdly, they are wholly *Subterrany*; Whereas *Plants* are part above *Earth*, and part under *Earth*.

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There be very few *Creatures*, that participate of the *Nature* of *Plants*, and *Metals* both; *Corall* is one of the Nearest of both *Kindes*: Another is *Vitrioll*, for that is aptest to sprout with *Moisture*.

605

Another speciall *Affinitie* is betweene *Plants* and *Mould* or *Putrefaction*: For all *Putrefaction* (if it dissolve not in *Arefaction*) will in the end issue into *Plants*, or *Living Creatures* bred of *Putrefaction*. I account *Mosse*, and *Mushromes* and *Agaricke*, and other of those kinds, to be but *Moulds* of the *Ground*, *walls*, and *Trees*, and the like. As for *Flesh*, and *Fish*, and *Plants* themselves, and a Number of other things, after a *Mouldinesse*, or *Routennes*, or *Corrupting*, they will fall to breed *Wormes*. These *Putrefactions*, which have *Affinitie* with *Plants*, have this *Difference* from them; That they have no *Succeſſion* or *Propagation*, though they *Nourish*, and have a *Period* of *Life*, and have likewise some *Figure*.

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I left once, by chance, a *Citron* cut, in a close Roome, for three Summer-moneths, that I was absent; And at my Returne, there were growne forth, out of the Pith cut, *Tufts* of *Haires*, an Inch long, with little blacke Heads, as if they would have beene some *Herbe*.

Experiments  
in Consort,  
touching the  
*Affinities*, and  
*Differences*, of  
*Plants*, and  
*Living Crea-  
tures*: And  
the *Consue-  
ples* of them.

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THE *Affinities* and *Differences* betweene *Plants* and *Living Creatures*, are these that follow. They have both of them *Spirits Continued*, and *Branched*, and also *Inflamed*: But first in *Living Creatures*, the *Spirits* have a *Cell* or *Seat*, which *Plants* have not; As was also formerly said. And secondly, the *Spirits* of *Living Creatures* hold more of *Flame*, than the *Spirits* of *Plants* doe. And these two are the *Radicall Differences*. For the *Secondary Differences*, They are, as follow. First, *Plants* are all *Fixed* to the *Earth*; Whereas all *Living Creatures* are severed, and of themselves. Secondly, *Living Creatures* have *Locall Motion*; *Plants* have not. Thirdly, *Living Creatures* nourish from their *Vpper Parts*, by the *Mouth* chiefly; *Plants* nourish from below, namely from the *Rootes*. Fourthly, *Plants* have their *Seed* and *Seminall Parts* uppermost; *Living Creatures* have them lowermost: And therefore it was said, not elegantly alone, but Philosophically; *Homo est Plania inversa*; *Man is like a Plant turned upwards*: For the *Root* in *Plants*, is as the *Head* in *Living Creatures*. Fifthly, *Living Creatures* have a more exact *Figure* than *Plants*. Sixthly, *Living Creatures* have more *Diversity* of *Organs* within their *Bodies*, and (as it were) *Inward Figures*, than *Plants* have. Seventhly, *Living Creatures* have *Sense*, which *Plants* have not. Eighthly, *Living Creatures* have *Voluntary Motion*, which *Plants* have not.

608

For the *Difference* of *Sexes* in *Plants*, they are oftentimes by name distinguished; As *Male-Piony*, *Female-Piony*; *Male-Rose-mary*, *Female-Rose-mary*; *Hee-Holly*, *Shee-Holly*, &c. but *Generation* by *Copulation* (certainly) extendeth not to *Plants*. The nearest Approach of it, is betweene the *Hee-Palme*, and the *Shee-Palme*; which, (as they report,) if they grow neare, incline the one to the other: In so much as, (that which is more strange,) they doubt not to report, that to keep the *Trees* upright from *Bending*, they tie *Ropes*, or *Lines*, from the one to the other, that the *Contact* might be enjoyed by the *Contact* of a *Middle Body*. But this may be *Faigned*, or at least *Amplified*. Neverthelesse, I am apt enough to thinke, that this same *Binarium* of a  
Stronger



Stronger and a Weaker, like unto *Masculine* and *Feminine*, doth hold in all *Living Bodies*. It is confounded sometimes; As in some *Creatures* of *Putrefaction*, wherein no *Markes* of *Distinction* appeare: and it is doubled sometimes; As in *Hermaphrodites*: But generally there is a *Degree* of *Strength* in most *Species*.

The *Participles* or *Confiners* between *Plants* and *Living Creatures*, are such chiefly, as are *Fixed*, and have no *Locall Motion* of *Remove*, though they have a *Motion* in their *Parts*; Such as are *Oysters*, *Cockles*, and such like. There is a *Fabulous Narration*, that in the *Northerne Countries*, there should be an *Herb* that groweth in the likenesse of a *Lambe*, and feedeth upon the *Grasse*, in such sort, as it will bare the *Grasse* round about. But I suppose that the *Figure* maketh the *Fable*; For so wee see, there be *Bee-Flowers*, &c. And as for the *Grasse*, it seemeth the *Plant*, having a great *Stalke* and *Top*, doth prey upon the *Grasse*, a good way about, by drawing the *Juyce* of the *Earth* from it.

The *Indian Fig* boweth his *Roots* downe so low, in one yeare, as of it selfe it taketh *Root* againe: And so multiplyeth from *Root* to *Root*; Making of one *Tree* a kinde of *Wood*. The *Cause* is the *Plenty* of the *Sap*, and the *Sofnesse* of the *Stalke*, which maketh the *Bough*, being over-loaden, and not stiffely upheld, weigh downe. It hath *Leaves*, as broad as a little *Target*, but the *Fruit* no bigger than *Beanes*. The *Cause* is, for that the continuall *Shade* increaseth the *Leaves*, and abateth the *Fruit*; which neverthelesse is of a pleasant *Taste*. And that (no doubt) is caused, by the *Suppleness* and *Gentleness* of the *Juyce* of that *Plant*, being that which maketh the *Boughes* also so *Flexible*.

It is reported by one of the *Ancients*, that there is a certain *Indian Tree*, having few, but very great, *Leaves*, three *Cubits* long, and two broad; And that the *Fruit* being of good *Taste*, groweth out of the *Barke*. It may be, there be *Plants* that poure out the *Sap* so fast, as they have no leisure, either to divide into many *Leaves*, or to put forth *Stalkes* to the *Fruit*. With us *Trees* (generally) have small *Leaves* in comparison. The *Fig* hath the greatest; And next it the *Vine*, *Mulberry*, and *Sycamore*; And the least are those of the *Willow*, *Birch*, and *Thorne*. But there be found *Herbs* with farre greater *Leaves* than any *Tree*; As the *Burrie*, *Gourd*, *Cucumber*, and *Colewort*. The *Cause* is, (like to that of the *Indian Fig*,) the hasty and plentifull Putting forth of the *Sap*.

There be three *Things* in use for *Sweetnesse*; *Sugar*, *Honey*, *Manna*. For *Sugar*, to the *Ancients* it was scarce knowne, and little used. It is found in *Canes*: *Quere*, whether to the first *Knuckle*, or further up? And whether the very *Barke* of the *Cane* it selfe doe yeeld *Sugar*, or no? For *Honey*, the *Bee* maketh it, or gathereth it; But I have heard from one, that was industrious in *Husbandry*, that the labour of the *Bee* is about the *Wax*; And that hee hath knowne in the beginning of *May*, *Honey-Combes* empty of *Honey*; And within a fortnight, when the *Sweet Dewes* fall, filled like a *Cellar*. It is reported by some of the *Ancients*, that there is a *Tree* called *Occhus*, in the *Valleyes* of *Hyrkania*, that distilleth *Honey* in the *Mornings*. It is not unlike, that the *Sap* and *Teares* of some *Trees*, may be sweet. It may be also, that some sweet *Juyces*, fit for many uses, may bee concocted out of *Fruits*, to the *Thicknesse* of *Honey*, or perhaps of *Sugar*; The likeliest are *Rasins* of the *Sunne*, *Figs*, and *Corrans*: The *Meanes* may be enquired.

The *Ancients* report of a *Tree*, by the *Persian Sea*, upon the *Shore-Sands*, which

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Experiments  
Promiscuous  
touching  
Plants.

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which is nourished with the *Salt-water*; And when the *Tide* ebbeth, you shall see the *Roots*, as it were, bare without *Barke*, (being as it seemeth corroded by the *Salt*;) and grasping the *Sands* like a *Crab*; Which neverthelesse beareth a *Fruit*. It were good to trie some *Hard Trees*, as a *Service-Tree*, or *Firre-Tree*, by setting them within the *Sands*.

614 There bee of *Plants*, which they use for *Garments*, these that follow, *Hempe*; *Flax*; *Cotton*; *Nettles*, (whereof they make *Nettle-Cloth*;) *Sericum*, which is a *Growing Silke*; They make also *Cables* of the *Barke* of *Lime-Trees*. It is the *Stalke* that maketh the *Filaceous Matter*, commonly; And sometimes the *Downe* that groweth above.

615 They have, in some *Countries*, a *Plant* of a *Rosy Colour*, which shutteth in the *Night*, Openeth in the *Morning*, and Openeth wide at *Noone*; which the *Inhabitants* of those *Countries* say is a *Plant* that *Sleepe*th. There bee *Sleepers* enough then; For almost all *Flowers* doe the like.

616 Some *Plants* there are, but rare, that have a *Mossy* or *Downy Root*; And likewise that have a Number of *Threds*, like *Beards*; As *Mandrakes*; whereof *Witches*, and *Impossours* make an ugly *Image*, giving it the *Forme* of a *Face* at the *Top* of the *Root*, and leave those *Sirings* to make a broad *Beard* down to the *Foot*. Also there is a *Kinde* of *Nard*, in *Crete*, (being a *Kinde* of *Phu*) that hath a *Root* hairy, like a *Rough-Footed-Doves* foot. So as you may see, there are of *Roots*, *Bulbous Roots*, *Fibrous Roots*, and *Hirsute Roots*. And, I take it, in the *Bulbous*, the *Sap* hasteneth most to the *Aire*, and *Sunne*: In the *Fibrous*, the *Sap* delighteth more in the *Earth*, and therefore putteth downward: And the *Hirsute* is a *Middle* betweene both; That besides the *Putting* forth upwards, and downwards; putteth forth in *Round*.

617 There are some *Teares* of *Trees*, which are kembed from the *Beards* of *Goats*: For when the *Goats* bite and crop them, especially in the *Mornings*, the *Dew* being on, the *Teare* commeth forth, and hangeth upon their *Beards*: Of this Sort is some kinde of *Ladanum*.

618 The *Irrigation* of the *Plane-Tree* by *Wine*, is reported by the *Ancients*, to make it *Fruitfull*. It would be tried likewise with *Roots*; For upon *Seeds* it worketh no great *Effects*.

619 The way to carry *Forraine Roots*, a long Way, is to vessell them close in *Earthen Vessels*. But if the *Vessels* be not very *Great*, you must make some *Holes* in the *Bottom*, to give some *Refreshment* to the *Roots*; Which otherwise (as it seemeth,) will decay, and suffocate.

620 The ancient *Cinnamon*, was, of all other *Plants*, while it grew, the *Dryest*; And those Things, which are knowne to comfort other *Plants*, did make that more *Sterill*: For in *Showers* it prospered worst: It grew also amongst *Bushes* of other kindes, where commonly *Plants* doe not thrive: Neither did it love the *Sunne*: There might be one *Cause* of all those *Effects*; Namely, the sparing *Nourishment*, which that *Plant* required. Quere how farre *Cassia*, which is now the *Substitute* of *Cinnamon*, doth participate of these Things.

621 It is reported by one of the *Ancients*, that *Cassia*, when it is gathered, is put into the *Skins* of *Beasts*, newly fleyed; And that the *Skins* Corrupting, and Breeding *Wormes*, the *Wormes* doe devoure the *Pith* and *Marrow* of it, and so make it *Hollow*; But Meddle not with the *Barke*, because to them it is bitter.

622 There were, in *Ancient Time*, *Vines*, of farre greater *Bodies*, then we know any; For there have been *Cups* made of them, and an *Image* of *Iupiter*. But it is like they were *Wilde-Vines*; For the *Vines*, that they use for *Wine*, are so often



often Cut, and so much Digged and Dressed, that their Sap spendeth into the *Grapes*, and so the *Stalke* cannot increase much in *Bulke*. The *Wood* of *Vines* is very durable, without *Rotting*. And that which is strange, though no *Tree* hath the *Twigges*, while they are green, so brittle, yet the *Wood* dried is extreame *Tough*; And was used by the *Captaines* of *Armies*, amongst the *Romans*, for their *Cudgells*.

It is reported, that in some *Places*, *Vines* are suffered to grow like *Herbs*, spreading upon the *Ground*; And that the *Grapes* of those *Vines* are very great. It were good to make triall, whether *Plants* that use to bee borne up by *Props*, will not put forth greater *Leaves*, and greater *Fruits*, if they be laid along the *Ground*; As *Hops*, *Ivie*, *Woodbine*, &c.

*Quinces*, or *Apples*, &c. if you will keep them long, drowne them in *Honey*; But because *Honey* (perhaps) will give them a *Taste* Overluscious, it were good to make *Triall* in *Powder* of *Sugar*; Or in *Syrup* of *Wine* onely *Boyled* to *Height*. Both these would likewise be tried in *Orenge*s, *Limon*s, and *Pomegranats*; For the *Powder* of *Sugar*, and *Syrup* of *Wine*, will serve for times more than once.

The *Conservation* of *Fruit* would be also tried in *Vessels*, filled with *Fine Sand*, or with *Powder* of *Chalke*; Or in *Meale* and *Flower*; Or in *Dust* of *Oake-wood*; Or in *Mill*.

Such *Fruits*, as you appoint for *Long Keeping*, you must gather before they be full *Ripe*; And in a *Faire* and *Drie Day*, towards *Noone*; And when the *Winde* bloweth not *Southe*; And when the *Moone* is under the *Earth*; And in *Decrease*.

Take *Grapes*, and hang them in an *Empty Vessel*, well *Stopped*; And set the *Vessel*, not in a *Cellar*, but in some *drie Place*; And it is said, they will last long. But it is reported by some, they will keepe better, in a *Vessel* halfe full of *Wine*, so that the *Grapes* touch not the *Wine*.

It is reported, that the *Preserving* of the *Stalke*, helpeth to preserve the *Grape*; Especially if the *Stalke* be put into the *Pub* of *Elder*, the *Elder* not touching the *Fruit*.

It is reported by some of the *Ancients*, that *Fruit* put in *Bottles*, and the *Bottles* let downe into *Wells* under *Water*, will keep long.

Of *Herbs* and *Plants*, some are good to eat *Raw*; As *Lettuce*, *Endive*, *Purslane*, *Tarragon*, *Cresses*, *Cucumbers*, *Musk-Melons*, *Radish*, &c. Others onely after they are *Boyled*, or have *Passed the Fire*; As *Parsley*, *Clary*, *Sage*, *Parsnips*, *Turnips*, *Asparagus*, *Artichoakes*, (though they also being young are eaten *Raw*;) But a *Number* of *Herbs* are not *Esculent* at all; As *Worme-wood*, *Grasse*, *Greene-Corne*, *Centory*, *Hyssope*, *Lavender*, *Balme*, &c. The *Causes* are, for that the *Herbs*, that are not *Esculent*, doe want the two *Tastes*, in which *Nourishment* resteth; Which are, *Fat*, and *Sweet*; And have (contrariwise) *Bitter*, and *Over-strong Tastes*, or a *Iuyce* so *Crude*, as cannot bee ripened to the degree of *Nourishment*. *Herbs* and *Plants*, that are *Esculent Raw*, have *Fatnesse*, or *Sweetnesse*, (as all *Esculent Fruits*;) Such are *Onions*, *Lettuce*, &c. But then it must be such a *Fatnesse*, (for as for *Sweet Things*, they are in effect alwayes *Esculent*;) as is not *Over-grosse*, and *Loading* of the *Stomach*; For *Parsnips* and *Leekes* have *Fatnesse*; But it is too *Grosse* and *Heavy* without *Boyling*. It must be also in a *Substance* somewhat *Tender*; For wee see *Wheat*, *Barley*, *Artichoakes*, are no good *Nourishment*, till they have passed the *Fire*; But the *Fire* doth ripen, and maketh them soft and tender, and so they become *Esculent*. As for *Radish*, and *Tarragon*, and the like, they are for *Condiments*, and not for *Nourishment*. And even some of those *Herbes*, which are not *Escu-*

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lens, are notwithstanding *Poculent*; As *Hop's*, *Broome*, &c. *Quære* what Herbs are good for *Drinke*, besides the two aforementioned; For that it may (perhaps) ease the Charge of *Brewing*, if they make *Beere* to require lesse *Malt*, or make it last longer.

631

*Parts* fit for the *Nourishment* of *Man*, in *Plants*, are, *Seeds*, *Roots*, and *Fruits*; But chiefly *Seeds*, and *Roots*. For *Leaves*, they give no *Nourishment* at all, or very little: No more doe *Flowers*, or *Blossomes*, or *Stalkes*. The Reason is, for that *Roots*, and *Seeds*, and *Fruits*, (in as much as all *Plants* consist of an *Oily* and *Wairie* Substance commixed,) have more of the *Oily* Substance; And *Leaves*, *Flowers*, &c. of the *Wairy*. And secondly, they are more *Concocted*; For the *Root*, which continueth ever in the *Earth*, is still *Concocted* by the *Earth*; And *Fruits*, and *Graines*, (wee see) are halfe a yeare, or more, in *Concocting*; Whereas *Leaves* are out, and *Perfect* in a *Moneth*.

632

*Plants* (for the most part) are more strong, both in *Taste*, and *Smell*, in the *Seed*, than in the *Leafe*, and *Root*. The Cause is, for that in *Plants*, that are not of a *Fierce* and *Eager Spirit*, the *Vertue* is increased by *Concoction*, and *Maturation*, which is ever most in the *Seed*; But in *Plants*, that are of a *Fierce* and *Eager Spirit*, they are stronger whilest the *Spirit* is enclosed in the *Root*; And the *Spirits* doe but weaken, and dissipate, when they come to the *Aire*, and *Sunne*; As wee see it in *Onions*, *Garlicke*, *Dragon*, &c. Nay there be *Plants*, that have their *Roots* very *Hot*, and *Aromaticall*; And their *Seeds* rather *Inspide*; As *Ginger*. The Cause is (as was touched before,) for that the *Heat* of those *Plants* is very *Dissipable*; which under the *Earth* is contained and held in; But when it commeth to the *Aire*, it exaleth.

633

The *Iuyces* of *Fruits* are either *Wairy*, or *Oylie*. I reckon amongst the *Wairy*, all the *Fruits* out of which *Drinke* is expressed; As the *Grape*, the *Apple*, the *Peare*, the *Cherry*, the *Pomegranate*, &c. And there are some others, which, though they be not in use for *Drinke*, yet they appeare to bee of the same *Nature*; As *Plums*, *Services*, *Malberries*, *Rasps*, *Orenge*, *Lemons*, &c. And for those *Iuyces*, that are so fleshy, as they cannot make *Drinke* by *Expression*, yet (perhaps) they may make *Drinke* by *Mixture* of *Water*;

*Poculaque admistis imitantur vitea Sorbis.*

And it may be *Heps* and *Brier-Berries* would doe the like. Those that have *Oylie Iuyces*, are; *Olives*, *Almonds*, *Nuts* of all sorts, *Pine-Apples*, &c. And their *Iuyces* are all *Inflammable*. And you must observe also, that some of the *Wairy Iuyces*, after they have gathered *Spirit*, will *Burne* and *Enflame*; As *Wine*. There is a *Third Kinde* of *Fruit*, that is sweet, without either *Sharpenesse*, or *Oylineffe*: Such as is the *Fig*, and the *Date*.

634

It hath beene noted, that most *Trees*, and specially those that beare *Mast*, are fruitfull but once in two yeares. The Cause (no doubt) is, the *Expense* of *Sap*; For many *Orchard-Trees*, well *Cultured*, will beare divers yeares together.

635

There is no *Tree*, which besides the *Naturall Fruit*, doth beare so many *Bastard-Fruits*, as the *Oake* doth: For besides the *Acorns*, it beareth *Galls*, *Oake-Apples*, and certaine *Oake-Nuts*, which are *Inflammable*; And certaine *Oake-Berrier*, sticking close to the *Body* of the *Tree*, without *Stalke*. It beareth also *Misseltoe*, though rarely. The Cause of all these may be, the *Closenesse* and *Solidnesse* of the *Wood*, and *Pith* of the *Oake*; Which maketh severall *Iuyces* finde severall *Eruptions*. And therefore if you will devise to make any *Super-Plants*, you must ever give the *Sap* *Plentifull Rising*, and *Hard Issue*.

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There are two *Excrefcences*, which grow upon *Trees*; Both of them in the Nature of *Mushromes*: The one the *Romanes* called *Boletus*; Which groweth upon the *Roots* of *Oakes*; And was one of the *Dainties* of their *Table*; The other is *Medicinnall*, that is called *Agaricke*, (whereof we have spoken before,) which groweth upon the *Tops* of *Oakes*; Though it be affirmed by some, that it groweth also at the *Roots*. I doe conceive, that many *Excrefcences* of *Trees* grow chiefly, where the *Tree* is dead, or faded; For that the *Naturall Sap* of the *Tree*, corrupteth into some *Preternaturall Substance*.

636

The greater Part of *Trees* beare *Moss*, and *Best*, on the *Lower-Boughes*; As *Oakes*, *Figs*, *Wall-Nuts*, *Peares*, &c. But some beare *Best* on the *Top-Boughes*; As *Crabs*, &c. Those that beare best below, are such, as *Shade* doth more good to, than *Hurt*. For generally all *Fruits* beare best lowest; Because the *Sap* tireth not, having but a short *Way*: And therefore in *Fruits* spread upon *Walls*, the *Lowest* are the *Greatest*, as was formerly said; So it is the *Shade* that hindereth the *Lower-Boughes*; Except it be in such *Trees*, as delight in *Shade*; Or at least beare it well. And therefore, they are either *Strong Trees*, as the *Oake*; Or else they have large *Leaves*, as the *Wallnut* and *Fig*; Or else they grow in *Piramis*, as the *Pear*. But if they require very much *Sunne*, they beare best on the *Top*; As it is in *Crabs*, *Apples*, *Plums*, &c.

637

There be *Trees*, that beare best, when they begin to bee *Old*; As *Almonds*, *Peares*, *Vines*, and all *Trees* that give *Mast*. The *Cause* is, for that all *Trees*, that beare *Mast*, have an *Oily Fruit*; And *Young Trees* have a more *Watry Iuyce*, and lesse *Concocted*; And of the same kinde also is the *Almond*. The *Pear* likewise, though it be not *Oylie*, yet it requireth much *Sap*, and well *Concocted*; For we see it is a *Heavy Fruit*, and *Solide*; Much more than *Apples*, *Plums*, &c. As for the *Vine*, it is noted, that it beareth more *Grapes* when it is *Young*; But *Grapes* that make better *Wine*, when it is *Old*; For that the *Iuyce* is better *Concocted*: And we see, that *Wine* is *Inflammable*; So as it hath a kinde of *Oylineffe*. But the most Part of *Trees*, amongst which are *Apples*, *Plums*, &c. beare best when they are *Young*.

638

There be *Plants*, that have a *Milke* in them, when they are *Cut*; As *Figs*, *Old-Lettuce*, *Sow-Thistles*, *Spurge*, &c. The *Cause* may be an *Inception* of *Putrefaction*; For those *Milkes* have all an *Acrimony*; Though one would thinke they should be *Lenitive*. For if you write upon *Paper*, with the *Milke* of the *Fig*, the *Letters* will not be seene, untill you hold the *Paper* before the *Fire*, & then they wax *Brown*, which sheweth that it is a *Sharp* or *Fretting Iuyce*: *Lettuce* is thought *Poysonous*, when it is so *Old*, as to have *Milke*; *Spurge* is a kinde of *Poyson* in it Selfe; And as for *Sow-Thistles*, though *Coneyes* eat them, yet *Sheep* and *Cattell* will not touch them; And besides, the *Milke* of them, rubbed upon *Warts*, in short time, weareth them away: Which sheweth the *Milke* of them to be *Corrosive*. We see also, that *Wheat*, & other *Corn sown*, if you take them forth of the *Ground*, before they sprout, are full of *Milke*; And the *Beginning* of *Germination* is ever a *Kinde* of *Putrefaction* of the *Seed*. *Euphorbium* also hath a *Milke*, though not very white, which is of a great *Acrimony*. And *Saladine* hath a yellow *Milke*, which hath likewise much *Acrimony*; For it cleanseth the *Eyes*. It is good also for *Cataracts*.

639

*Mushromes* are reported to grow, as well upon the *Bodies* of *Trees*, as upon their *Roots*, or upon the *Earth*: And especially upon the *Oake*. The *Cause* is, for that *strong Trees*, are towards such *Excrefcences*, in the Nature of *Earth*; And therefore put forth *Mosse*, *Mushromes*, and the like.

640

There



641

There is hardly found a *Plant*, that yeeldeth a *Red Iuyce*, in the *Blade*, or *Eare*; Except it bee the *Tree* that beareth *Sanguis Draconis*: Which groweth (chiefly) in the *Island Soquatra*: The *Herbe Amaranthus*, (indeed,) is *Red* all over; And *Brasill* is *Red* in the *Wood*: And so is *Red Sanders*. The *Tree* of the *Sanguis Draconis*, groweth in the forme of a *Sugar-Loafe*. It is like, the *Sap* of that *Plant*, concocteth in the *Body* of the *Tree*. For we see that *Grapes*, and *Pomegranats*, are *Red* in the *Iuyce*, but are *Greene* in the *Teare*: And this maketh the *Tree* of *Sanguis Draconis*, lesser towards the *Top*; Because the *Iuyce* hasteneth not up; And besides, it is very *Astringent*; And therefore of *Slow Motion*.

642

It is reported, that *Sweet Mosse*, besides that upon the *Apple-Trees*, groweth likewise (sometimes) upon *Poplars*; And yet (generally) the *Poplar* is a *Smooth Tree* of *Barke*, and hath little *Mosse*. The *Mosse* of the *Larix Tree* burneth also sweet, and sparkleth in the *Burning*. *Quere* of the *Mosses* of *Odorate Trees*; As *Cedar*, *Cypres*, *Lignum Aloes*, &c.

643

The *Death* that is most without *Paine*, hath beene noted to be, upon the *Taking* of the *Potion* of *Hemlocke*; which in *Humanity* was the *Forme* of *Execution* of *Capitall Offenders* in *Athens*. The *Poyson* of the *Aspe*, that *Cleopatra* used, hath some affinity with it. The *Cause* is, for that the *Torments* of *Death* are chiefly raised by the *Strife* of the *Spirits*; And these *Vapours* quench the *Spirits* by *Degrees*; Like to the *Death* of an extreme *Old Man*. I conceive it is lesse *Painfull* than *Opium*, because *Opium* hath *Parts* of *Heat* mixed.

644

There be *Fruits*, that are *Sweet* before they be *Ripe*; As *Mirabolanes*; So *Fennell-Seeds* are *Sweet* before they ripen, and after grow *Spicy*. And some never *Ripen* to be *Sweet*; As *Tamarinds*, *Barberries*, *Crabs*, *Sloes*, &c. The *Cause* is, for that the former *Kinde* have much and subtile *Heat*, which causeth *Early Sweetnesse*; The latter have a *Cold* and *Acide Iuyce*, which no *Heate* of the *Sunne* can sweeten. But as for the *Mirabolane*, it hath *Parts* of *Contrary Natures*; For it is *Sweet*, and yet *Astringent*.

645

There be few *Herbs* that have a *Salt Taste*; And contrariwise all *Bloud* of *Living Creatures* hath a *Saltnesse*: The *Cause* may bee, for that *Salt*, though it be the *Rudiment* of *Life*, yet in *Plants* the *Originall Taste* remaineth not; For you shall have them *Bitter*, *Sower*, *Sweet*, *Biting*, but seldome *Salt*: But in *Living Creatures*, all those *High Tastes* may happen to be (sometimes) in the *Humours*, but are seldome in the *Flesh*, or *Substance*; Because it is of a more *Oily Nature*; which is not very *Susceptible* of those *Tastes*; And the *Saltnesse* it selfe of *Bloud*, is but a light, and secret *Saltnesse*: And even among *Plants*, some doe participate of *Saltnesse*, as *Alga Marina*, *Samphire*, *Scorvy-Grasse*, &c. And they report, there is, in some in the *Indian Seas*, a *Swimming Plant*, which they call *Salgarnus*, spreading over the *Sea*, in such sort, as one would thinke it were a *Meadow*. It is certaine, that out of the *Ashes*, of all *Plants*, they extract a *Salt*, which they use in *Medicines*.

646

It is reported by one of the *Ancients*, that there is an *Herbe* growing in the *Water*, called *Lincostis*, which is full of *Prickles*: This *Herbe* putteth forth another small *Herbe* out of the *Leafe*; which is imputed to some *Moisture*, that is gathered betweene the *Prickles*, which *Putrified* by the *Sunne*, *Germi*nateth. But I remember also I have seene, for a great *Rarity*, one *Rose* grow out of another, like *Honey-Suckles*, that they call *Top* and *Top-gallants*.

647

*Barley*, (as appeareth in the *Making*,) being steeped in *Water* three dayes, and afterwards the *Water* drained from it, and the *Barley* turned upon a drie floare, will sprout, halfe an *Inch* long at least: And if it bee let alone, and

not



not turned, much more; untill the Heart be out. *Wheat* will doe the same. Tria it also with *Pease*, and *Beanes*. This *Experiment* is not like that of the *Orpin*, and *Semper-Vive*; For there it is of the old Store, for no *Water* is added; But here it is nourished from the *Water*. The *Experiment* would be further driven: For it appeareth already, by that which hath beene said, that *Earth*, is not necessary to the first Sprouting of *Plants*; And we see that *Rose-Buds* set in *Water*, will Blow: Therefore trie whether the *Sprouts* of such *Graines* may not be raised to a further Degree; As to an *Herbe*, or *Flower*, with *Water* onely; Or some small commixture, of *Earth*: For if they will, it should seeme by the *Experiments* before, both of the *Malt*, and of the *Roses*, that they will come farre faster on in *Water*, than in *Earth*: For the *Nourishment* is easilier drawne out of *Water*, than out of *Earth*. It may give some light also, that *Drinke* infused with *Flesh*, as that with the *Capon*, &c. will nourish faster and easilier, than *Meat* and *Drinke* together. Tria the same *Experiment* with *Roots*, as well as with *Graines*: as for Example, take a *Turnip*, and steepe it a while, and then drie it, and see whether it will sprout.

*Malt* in the *Drenching* will swell; And that in such a manner, as after the Putting forth in *Sprouts*, and the drying upon the *Keele*, there will be gained at least a Bushell in eight, and yet the *Sprouts* are rubbed off; And there will be a Bushell of *Dust* besides the *Malt*: Which I suppose to be, not onely by the loose, and open Laying of the *Paris*, but by some Addition of *Substance*, drawne from the *Water*, in which it was steeped.

*Malt* gathereth a *Sweetnesse* to the *Taste*, which appeareth yet more in the *wort*. The *Dulcoration* of *Things* is worthy to be tried to the full; For that *Dulcoration* importeth a degree to *Nourishment*: And the Making of *Things* *Inalimentall*, to become *Alimentall*, may be an *Experiment* of great Profit, for Making new *Vitall*.

Most *Seeds* in the *Growing*, leave their *Husk* or *Rinde* about the *Root*; But the *Onion* will carry it up, that it will be like a Cap upon the Top of the *Young Onion*. The Cause may be, for that the *Skin* or *Huske* is not easie to break, as we see by the Pilling of *Onions*, what a holding *Substance* the *Skin* is.

*Plants*, that have *Curled Leaves*, doe all abound with *Moysture*; Which commeth so fast on, as they cannot spread themselves Plain, but must needs gather together. The Weakest Kinde of *Curling* is *Roughnesse*; As in *Clary*, and *Burre*. The Second is *Curling* on the Sides; As in *Lettuce*, and *Young Cabbage*: And the Third is *Folding* into an *Head*; As in *Cabbage* full growne, and *Cabbage-Lettuce*.

It is reported, that *Firre*, and *Pine*, especially if they be *Old* and *Purified*, though they shine not, as some *Rotten Woods* doe, yet in the sudden *Breaking* they will sparkle like *Hard Sugar*.

The *Roots* of *Trees* doe, (some of them,) put downwards deepe into the *Ground*; As the *Oake*, *Pine*, *Firre*, &c. Some spread more towards the *Surface* of the *Earth*; As the *Ash*, *Cypresse-Tree*, *Olive*, &c. The Cause of this latter may be, for that such *Trees* as love the *Sunne*, doe not willingly descend farre into the *Earth*; And therefore they are (commonly) *Trees*, that shoot up much; For in their *Body*, their desire of Approach to the *Sunne*, maketh them spread the lesse. And the same Reason, under *Ground*, to avoid *Recesse* from the *Sunne*, maketh them spread the more. And we see it commeth to passe in some *Trees*, which have beene planted too deepe in the *Ground*, that for love of Approach to the *Sunne*, they forsake their first *Root*, and put out another more towards the Top of the *Earth*. And wee see also, that the *Olive* is full of *Oylie Iuyce*; And *Ash* maketh the best *Fire*; And



*Cypresse* is an *Hot Tree*. As for the *Oake*, which is of the former sort, it loveth the *Earth*; And therefore groweth slowly. And for the *Pine*, and *Firre* likewise, they have so much *Heat* in themselves, as they need lesse the *Heat* of the *Sunne*. There be *Herbs* also, that have the same difference; As the *Herbe* they call *Morsus Diaboli*; which putterh the *Root* downe so low, as you cannot pull it up without *Breaking*; Which gave Occasion to the *Name*, and *Fable*; For that it was said, it was so wholesome a *Root*, that the *Devill*, when it was gathered, bit it for *Envy*: And some of the *Ancients* doe report, that there was a goodly *Firre*, (which they desired to remove whole, that had a *Root* under *Ground* eight Cubits deep; And so the *Root* came up broken.

654 It hath beene observed, that a *Branch* of a *Tree*, being *Unbarked* some space at the *Bottom*, and so set into the *Ground*, hath growen; even of such *Trees*, as if the *Branch* were set with the *Barke* on, they would not grow; yet contrariwise we see, that a *Tree* Pared round in the *Body*, above *Ground*, will die. The *Cause* may be, for that the *Unbarked Part* draweth the *Nourishment* best, but the *Barke* continueth it onely.

655 *Grapes* will continue *Fresh*, and *Moist*, all *Winter* long, if you hang them, *Cluster* by *Cluster*, in the *Roofe* of a *Warre* *Room*, Especially, if when you gather the *Cluster*, you take off with the *Cluster* some of the *Sticke*.

656 The *Reed* or *Cane* is a *Warry Plant*, and groweth not but in the *Water*; It hath these *Properties*; That it is *Hollow*; That it is *Knuckled* both *Stalke*, and *Root*; that being *Drie*, it is more *Hard* and *Fragile*, than other *Wood*; That it putteth forth no *Boughs*, though many *Stalks* out of one *Root*. It differeth much in greatnesse; The smallest being fit for *Thatching* of *Houses*; And *Stopping* the *Chinkes* of *Ships*; Better than *Glew*, or *Pitch*. The *Second* *Bignesse*, is used for *Angle-Rods*, and *Staves*; And in *China* for beating of *Offenders* upon the *Thighs*. The differing *Kinds* of them are; The *Common Reed*; The *Cassia Fistula*; And the *Sugar-Reed*. Of all *Plants*, it boweth the easiest, and riseth againe. It seemeth, that amongst *Plants*, which are nourished with *Mixture* of *Earth* and *Water*, it draweth most *Nourishment* from *Water*; which maketh it the *Smoothest* of all others in *Barke*; And the *Hollowest* in *Body*.

657 The *Sap* of *Trees*, when they are let *Bloud*, is of differing *Natures*. Some more *Warre* and *Cleare*; As that of *Vines*, of *Beeches*, of *Peares*. Some *Thick*; As *Apples*. Some *Gummy*; as *Cherries*. Some *Froathy*; As *Elmes*. Some *Milkie*; As *Figs*. In *Mulberries*, the *Sap* seemeth to be (almost) towards the *Barke* onely; For if you cut the *Tree* a little into the *Barke*, with a *Stone*, it will come forth; If you pierce it deeper with a *Toole*, it will bee drie. The *Trees*, which have the *Moistest* *Iuyces* in their *Fruit*, have commonly the *Moistest* *Sap* in their *Bodie*; For the *Vines* and *Peares* are very *Moist*; *Apples* somewhat more *Spongie*: The *Milke* of the *Figge* hath the *Qualitie* of the *Rennet*, to gather *Cheese*: And so have certaine *Soure Herbs* wherewith they make *Cheese* in *Len*.

658 The *Timber* and *Wood* are, in some *Trees*, more *Cleane*, in some more *Knottie*; And it is a good *Triall*, to trie it by *Speaking* at one *End*, and *Laying* the *Eare* at the *Other*: For if it be *Knottie*, the *Voice* will not passe well. Some have the *Veines* more varied and *chamloted*; As *Oake*, whereof *Wainscot* is made; *Maple*, whereof *Trenchers* are made: Some more *Smooth*, as *Firre* and *Walnut*: Some doe more easily breed *Wormes* and *Spiders*; Some more *hardly*, as it is said of *Irish Trees*: Besides there bee a *Number* of *Differences* that concerne their *Use*; As *Oake*, *Cedar*, and *Chesnut*, are the



the best Builders: Some are best for *Plough-Timber*; As *Ash*; Some for *Peeres*, that are sometimes wet, and sometimes drie; As *Elme*: Some for *Planchers*; As *Deale*: Some for *Tables*, *Cupboards*, and *Deskes*; As *Walnuts*: Some for *Ship-Timber*; As *Oakes* that grow in *Moist Grounds*; For that maketh the *Timber* Tough, and not apt to rift with *Ordinance*; Wherein *English* and *Irish Timber* are thought to excell: Some for *Masts of Ships*; As *Firre* and *Pine*, because of their *Length*, *Straightnesse*, and *Lightnesse*: Some for *Pale*; As *Oake*: Some for *Fuell*; As *Ash*: And so of the rest.

The *Comming* of *Trees* and *Plants* in certaine *Regions*, and not in others, is sometimes *Casual*: For many have beene translated, and have prospered well; As *Damaske-Roses*, that have not beene knowne in *England* above an hundred yeares, and now are so common. But the liking of *Plants* in certaine *Soiles*, more than in others, is meereley *Naturall*; As the *Firre* and *Pine* love the *Mountaines*; The *Poplar*, *Willow*, *Sallow*, and *Alder*, love *Rivers*, and *Moist Places*: The *Ash* loveth *Coppices*; But is best in *Standards* alone: *Iuniper* loveth *Chalke*; And so doe most *Fruit-Trees*: *Sampire* groweth but upon *Rockes*: *Reeds* and *Ofiers* grow where they are washed with *Water*: The *Vine* loveth *Sides of Hills*, turning upon the *South-East-Sunne*, &c.

The *Putting forth* of certaine *Herbs* discovereth of what *Nature* the *Ground* where they put forth, is: As *wilde Thyme* sheweth good *Feeding Ground* for *Cattell*: *Betony* and *Strawberries* shew *Grounds* fit for *Wood*: *Camomill* sheweth *Mellow Grounds* fit for *Wheat*. *Mustard-Seed*, growing after the *Plough*, sheweth a good *Strong Ground* also for *Wheat*: *Burnet* sheweth good *Meadow*: And the like.

There are found, in divers *Countries*, some other *Plants*, that grow out of *Trees*, and *Plants*, besides *Misseltoe*: As in *Syria*, there is an *Herb* called *Cassyas*, that groweth out of tall *Trees*, and windeth it selfe about the same *Tree* where it groweth; And sometimes about *Thornes*. There is a kinde of *Polypode*, that groweth out of *Trees*, though it windeth not. So likewise an *Herbe* called *Faunos*, upon the *wilde Olive*. And an *Herbe* called *Hippophaeston* upon the *Fullers Thorne*; Which, they say, is good for the *Falling-Sicknesse*.

It hath bin observed, by some of the *Anciens*, that howsoever *Cold* and *Easterly Winds*, are thought to be great *Enemies* to *Fruit*; yet nevertheless *South-winds* are also found to doe *Hurt*; Especially in the *Blossoming* time; And the more, if *Showers* follow. It seemeth, they call forth the *Moisture* too fast. The *West winds* are the best. It hath been observed also, that *Greene* and *Open Winters* doe hurt *Trees*; Insomuch as if two or three such *winters* come together, *Almond-Trees*, and some other *Trees*, will die. The *Cause* is the same with the former, because the *Lust* of the *Earth* overspendeth it selfe; Howsoever some other of the *Anciens* have commended *warne Winters*.

*Snowes*, lying long, cause a *Fruitfull Yeare*; For first, they keepe in the *Strength* of the *Earth*; Secondly, they water the *Earth*, better than *Raine*; For in *Snow*, the *Earth* doth (as it were) sucke the *Water*, as out of the *Teat*. Thirdly, the *Moisture* of *Snow* is the finest *Moisture*; For it is the *Froth* of the *Cloudy Waters*.

*Showers*, if they come a little before the *Ripening* of *Fruits*, doe good to all *Succulent* and *Moist Fruits*; As *Vines*, *Olives*, *Pomegranates*; Yet it is rather for *Plenty*, than for *Goodnesse*; For the best *wines* are in the *Driest Vintages*: *Small Showers* are likewise good for *Corne*, so as *Parching Heats* come not upon them. Generally, *Night-Showers* are better than *Day-*

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*Showers*; For that the *Sunne* followeth not so fast upon them: and wee see, even in *Waring* by the *Hand*, it is best, in *Summer* time, to water in the *Evening*.

665

The *Differences* of *Earths*, and the *Triall* of them, are worthy to bee diligently inquired. The *Earth*, that with *Showers* doth easiliest *Soften*, is commended; And yet some *Earth* of that kinde will be very *Drie*, and *Hard* before the *Showers*. The *Earth* that casteth up from the *Plough*, a great *Clod*, is not so good, as that, which casteth up a *Smaller Clod*. The *Earth*, that putteth forth *Mosse* easily, and may be called *Mouldie*, is not good. The *Earth*, that smelleth well upon the *Digging*, or *Ploughing*, is commended; As containing the *Iuyce* of *Vegetables* almost already prepared. It is thought by some, that the *Ends* of low *Raine-bowes*, fall more upon one kinde of *Earth* than upon another: As it may well be; For that the *Earth* is most *Rosside*: And therefore it is commended for a *Signe* of good *Earth*. The *Poorenesse* of the *Herbs*, (it is plaine,) shew the *Poorenesse* of the *Earth*; And especially if they be in *Colour* more darke: But if the *Herbs* shew *Withered*, or *Blasted* at the *Top*, it sheweth the *Earth* to be very *Cold*: And so doth the *Mossinesse* of *Trees*. The *Earth*, whereof the *Grasse* is soone *Parched* with the *Sunne*, and *Toasted*, is commonly *Forced Earth*, and *Barren* in his owne *Nature*. The *Tender*, *Cheffome*, and *Mellow Earth*, is the best; Being meere *Mould*, between the two *Extremes* of *Clay*, and *sand*; Especially if it be not *Loamy*, and *Binding*. The *Earth*, that after *Raine*, will scarce be *Ploughed*, is commonly *Fruitfull*; For it is *Cleaving*, and full of *Iuyce*.

666

It is strange, which is observed by some of the *Ancients*, that *Dust* helpeth the *Fruitfulnessse* of *Trees*; and of *Vines*, by name: Infomuch as they cast *Dust* upon them of purpose. It should seeme, that that *Powdring*, when a *Shower* commeth, maketh a kinde of *Soyling* to the *Tree*, being *Earth* and *Water*, finely laid on. And they note, that *Countries*, where the *Fields* and *Wayes* are *Dusty*, beare the best *Vines*.

667

It is commended by the *Ancients*, for an *Excellent Helpe* to *Trees*, to lay the *Stalkes*, and *Leaves* of *Lupines* about the *Roots*; Or to *Plough* them into the *Ground*, where you will sow *Corne*. The *Burning* also of the *Cuttings* of *Vines*, and *Casting* them upon *land*, doth much *Good*. And it was generally received of old, that *Dunging* of *Grounds*, when the *West Winde* bloweth, and in the *Decrease* of the *Moone*, doth greatly helpe; The *Earth* (as it seemeth) being then more *thirsty*, and open, to receive the *Dung*.

668

The *Grafting* of *Vines* upon *Vines*, (as I take it,) is not now in use: The *Ancients* had it, and that three wayes: The first was *Insution*, which is the Ordinary manner of *Grafting*: The Second was *Terebration*, through the *Middle* of the *Stocke*, and putting in the *Cions* there: And the Third was *Paring* of two *Vines*, that grow together, to the *Marrow*, and *Binding* them close.

669

The *Diseases* and ill *Accidents* of *Corne*, are worthy to be enquired; And would be more worthy to be enquired, if it were in *Mens Power* to helpe them; Whereas many of them are not to be remedied. The *Mill-dew* is one of the *Greatest*; which (out of question) commeth by *Closenesse* of *Aire*; And therefore in *Hills*, or large *Champaigne Grounds*, it seldome commeth; Such as is with us *York's Woald*. This cannot be remedied, otherwise than that in *Countries* of small *Enclosure*, the *Grounds* be turned into larger *Fields*: Which I have knowne to doe good in some *Farmes*. Another *Disease* is the *Putting forth* of *Wilde Oates*, whereinto *Corne* oftentimes, (especially *Barley*,) doth degenerate. It happeneth chiefly from the



the *weaknesse* of the *Graine* that is sown; For if it bee either too Old, or Mouldy, it will bring forth *wilde Oats*. Another *Disease* is the *Sacrie* of the *Ground*; For if you sow one *Ground* still with the same *Corne*, (I meane not the same *Corne* that grew upon the same *Ground*,) but the same *Kind* of *Graine*; (As *Wheat*, *Barley*, &c.) it will prosper but poorly: Therefore besides the *Resting* of the *Ground*, you must vary the *Seed*. Another ill *Accident* is, from the *Wind*, which hurt at two times; At the *Flouring*, by shaking off the *Flowers*; And at the full *Ripening*, by *Shaking* out the *Corne*. Another ill *Accident* is, *Drouth*, at the *Spindling* of the *Corne*; Which with us is rare; But in *Hotter Countries*, common: Insomuch as the Word, *Calamitas*, was first derived from *Calamus*, when the *Corne* could not get out of the *Stalke*. Another ill *Accident* is, *Over-wet* at *Sowing-Time*; which with us breedeth much *Dearth*; Insomuch as the *Corne* never cometh up; And (many times) they are forced to re-sow *Sommer-Corne*, where they sowed *Winter-Corne*. Another ill *Accident* is *Bitter Frosts*, continued, without *Snow*; Especially in the Beginning of the *Winter*, after the *Seed* is new Sown. Another *Disease* is *Wormes*; which sometimes breed in the *Root*; and happen upon *Hot Sunnes*, and *Showres*, immediately after the *Sowing*; And another *Worme* breedeth in the *Eare* it Selfe; Especially when *Hot Sunnes* breake often out of *Clouds*. Another *Disease* is *Weeds*; And they are such, as either Choak, and Over-shadow the *Corne*, and beare it downe; Or starve the *Corne*, and deceive it of *Nourishment*. Another *Disease* is, *Over-Ranknesse* of the *Corne*; Which they use to remedy, by *Mowing* it after it is come up; Or putting *Sheepe* into it. Another ill *Accident* is *Laying* of *Corne* with great *Raines*, neare, or in *Harvest*. Another ill *Accident* is, if the *Seed* happen to have touched *Oyle*, or any *Thing*, that is *Fat*; For those *Substances* have an *Antipathy* with *Nourishment* of *Water*.

The *Remedies* of the *Diseases* of *Corne* have beene observed as followeth. The *Steeping* of the *Graine*, before *Sowing*, a little time in *Wine*, is thought a *Preservative*: The *Mingling* of *Seed-Corne* with *Asbes*, is thought to be good: The *Sowing* at the *Wane* of the *Moone*, is thought to make the *Corne* sound: It hath not beene practised, but it is thought to bee of use, to make some *Misellane* in *Corne*; As if you sow a few *Beanes* with *Wheat*, your *wheat* will be the better. It hath beene observed, that the *Sowing* of *Corne* with *Houfleeke*, doth good. Though *Graine*, that toucheth *Oyle*, or *Fat*, receiveth hurt, yet the *Steeping* of it, in the *Dregs* of *Oyle*, when it beginneth to *Putrifie*, (which they call *Amurca*,) is thought to assure it against *Wormes*. It is reported also, that if *Corne* bee *Mowed*, it will make the *Graine* Longer, but *Emptier*, and having more of the *Huske*.

It hath beene noted, that *Seed* of a yeare old, is the Best; And of two or three yeares is worse; And that which is more Old, is quite Barren; Though (no doubt) some *Seed* and *Graines* last better than others. The *Corne*, which in the *Vanning* lieth lowest, is the best: And the *Corne*, which broken or bitten retaineth a little *Yellownesse*, is better than that which is very *White*.

It hath beene observed, that of all *Roots* of *Herbs*, the *Root* of *Sorrell* goeth the furthest into the *Earth*; Insomuch as it hath beene knowne to goe three *Cubits* deep; And that it is the *Root* that continueth fit (longest) to be set againe, of any *Root* that groweth. It is a *Cold*, and *Acide Herb*, that (as it seemeth) loveth the *Earth*, and is not much drawne by the *Sunne*.

It hath beene observed, that some *Herbs* like best, being watred with *Salt-water*; And *Radish*, *Beet*, *Ren*, *Pennyroyall*; This *Triall* would be extended

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to some other Herbs; Especially such as are Strong; As *Tarragon*, *Mustard-Seed*, *Rocket*, and the like.

674 It is strange that is generally received, how some *Poysonous Beasts* affect *Odorate* and *Wholsome Herbs*; As that the *Snake* loveth *Fennell*; That the *Toad* will be much under *Sage*; That *Frogs* will be in *Cinquefoile*. It may be, it is rather the *Shade*, or other *Coverture*, that they take liking in, than the *Vertue* of the *Herb*.

675 It were a Matter of great Profit, (save that I doubt it is too Conjecturall to venture upon,) if one could discern, what *Corn*, *Herbs*, or *Fruits*, are like to be in *Plenty*, or *Scarcity*, by some *Signes* and *Prognosticks*, in the Beginning of the *Yeare*: For as for those, that are like to be in *Plenty*, they may be bargained for, upon the *Ground*; As the Old Relation was of *Thales*; who to shew how easie it was for a *Philosopher* to be rich, when he fore-saw a great *Plenty* of *Olives*, made a *Monopoly* of them. And for *Scarcitie*, Men may make Profit in keeping better the Old Store. Long *Continuance* of *Snow* is beleev'd to make a *Fruitfull Year* of *Corn*: An *Early Winter*, or a very *Late Winter*, a *Barren Year* of *Corn*: An *Open* and *Serene Winter*, an ill *Yeare* of *Fruit*: These we have partly touched before: But other *Prognosticks* of like Nature are diligently to be enquired.

676 There seeme to be, in some *Plants*, *Singularities*, wherein they differ from all Other; The *Olive* hath the *Oily Part*, onely on the *Outside*; Whereas all other *Fruits* have it in the *Nut*, or *Kernell*. The *Firre* hath (in effect) no *Stone*, *Nut*, nor *Kernell*; Except you will count the little *Graines Kernells*. The *Pomegranate* and *Pine-Apple* have onely, amongst *Fruits*, *Graines* distinct in severall *Cells*. No *Herbs* have *Curled Leaves*, but *Cabbage*, and *Cabbage-Lettuce*. None have double *Leaves*, one belonging to the *Stalk*, another to the *Fruit* or *Seed*, but the *Artichoke*: No *Flower* hath that kind of *Spread* that the *Woodbine* hath. This may be a large *Field* of *Contemplation*; For it sheweth that in the *Frame* of *Nature*, there is, in the *Producing* of some *Species*, a *Composition* of *Matter*, which happeneth oft, and may be much diversified: In others, such as happeneth rarely, and admitteth little *Variety*: for so it is likewise in *Beasts*: *Dogs* have a *Resemblance* with *Wolves*, and *Foxes*; *Horses* with *Asses*; *Kine* with *Bufles*; *Hares* with *Coneys*; &c. And so in *Birds*: *Kites* and *Kestrels* have a *Resemblance* with *Hawkes*; *Common-Doves* with *Ring-Doves*, and *Turtles*; *Black-Birds* with *Thrushes*, and *Mavisses*; *Crowes* with *Ravens*, *Dames*, and *Choughes*, &c. But *Elephants*, and *Swine* amongst *Beasts*; And the *Bird of Paradise*, and the *Peacocke* amongst *Birds*; And some few others, have scarce any other *Species*, that have *Affinity* with them.

Wee leave the *Description* of *Plants*, and their *Vertues*, to *Herballs*, and other like *Bookes* of *Naturall History*: Wherein *Mens Diligence* hath beene great, even to *Curiositie*: For our *Experiments* are onely such, as doe ever ascend a *Degree* to the *Deriving* of *Causes*, and *Extracting* of *Axiomes*, which, we are not ignorant, but that some, both of the *Ancient*, and *Moderne Writers*, have also laboured; But their *Causes*, and *Axiomes*, are so full of *Imagination*, and so infected with the old *Received Theories*, as they are meere *Inquinations* of *Experience*, and Concoct it not.



**I**T hath beene observed, by some of the *Ancients*, that *Skins*, (especially of *Rammes*.) newly pulled off, and applyed to the *wounds* of *Stripes*, doe keepethem from Swelling, and Exulcerating; And likewise Heale them, and Close them up; And that the *Whites* of *Egges* doe the same. The Cause is a Temperate *Conglutination*; For both *Bodies* are Clammy, and Viscous, and doe bridle the *Deflux* of *Humours* to the Hurts, without Penning them in too much.

Experiment  
Solitary, touch-  
ing Healing  
of wounds.

677

**Y**OU may turne (almost) all *Flesh* into a *Fatty Substance*, if you take *Flesh*, and cut it into *Peece*s, and put the *Peece*s into a *Glasse* covered with *Parchment*; And so let the *Glasse* stand six or seven *Houres* in *Boyling Water*. It may bee an *Experiment* of Profit, for Making of *Fat*, or *Grease*, for many uses; But then it must be of such *Flesh* as is not *Edible*; As *Horses*, *Dogs*, *Beares*, *Foxes*, *Badgers*, &c.

Experiment  
Solitary touch-  
ing Fat dis-  
solved in *Flesh*.

678

**I**T is reported by one of the *Ancients*, that *New Wine*, put into *Vessels* well stopp'd, and the *Vessels* let downe into the *Sea*, will accelerate very much, The Making of them *Ripe*, and *Potable*. The same would be tried in *Wort*.

Experiment  
Solitary, touch-  
ing Ripening  
of *Drinke* be-  
fore the Time.

679

**B**EASTS are more *Hairy* than *Men*; And *Savage Men* more than *Civill*; And the *Plumage* of *Birds* exceedeth the *Pilosity* of *Beasts*. The Cause of the Smoothnesse in *Men*, is not any Abundance of *Heat*, and *Moisture*, though that indeed causeth *Pilosity*; But there is requisite to *Pilosity*, not so much *Heat* and *Moisture*, as *Excrementitious Heat* and *Moisture*: (For what-soever assimilath, goeth not into the *Haire*;) And *Excrementitious Moisture* aboundeth most in *Beasts*, and *Men* that are more *Savage*. Much the same Reason is there of the *Plumage* of *Birds*; For *Birds* assimilate lesse, and exerne more than *Beasts*: for their *Excrements* are ever liquid, and their *Flesh* (generally) more drie: Beside, they have not *Instruments* for *Urine*; And so all the *Excrementitious Moisture* goeth into the *Feathers*: And therefore it is no Marvell, though *Birds* bee commonly better Meat than *Beasts*, because their *Flesh* doth assimilate more finely, and fecerneth more subtilly. Againe, the *Head* of *Man* hath *Haire* upon the first *Birch*, which no other *Part* of the *Body* hath. The Cause may be Want of *Perspiration*: For Much of the Matter of *Haire*, in the other *Parts* of the *Body*, goeth forth by *Insensible Perspiration*; And besides, the *Skull* being of a more solide Substance, nourisheth and assimilath lesse, and exerneth more: And so likewise doth the *Chinne*; We see also that *Haire* commeth not upon the *Palms* of the *Hands*, nor *Soles* of the *Feet*; Which are *Parts* more *Perspirable*. And *Children* likewise are not *Hairy*, for that their *Skins* are more *Perspirable*.

Experiment  
Solitary touch-  
ing Pilosity  
and Plumage.

680

**B**IRDS are of *Swifter Motion* than *Beasts*: For the *Flight* of many *Birds* is *Swifter*, than the *Race* of any *Beasts*. The Cause is, for that the *Spirits* in *Birds*, are in greater Proportion, in comparison of the Bulke of their *Body*, than in *Beasts*: For as for the Reason that some give, that they are partly Carried, whereas *Beasts* goe, that is Nothing; For by that Reason *Swimming* should be swifter, than *Running*: And that Kinde of *Carriage* also, is not without Labour of the *Wing*.

Experiments  
Solitary, touch-  
ing the  
Quicknesse of  
Motion in  
*Birds*.

681

**T**HE *Sea* is *Clearer*, when the *North-Wind* bloweth, than when the *South-Wind*. The Cause is, for that *Salt-Water* hath a little *Oyline* in the *Surface* thereof; As appeareth in very *Hot Days*: And againe, for that the

Experiment  
Solitary, touch-  
ing the dif-  
ferent Cleare-  
nesse of the  
*Sea*.

682

Southerne



*Southerne* Wind relaxeth the *Water* somewhat; As no *Water* Boiling is so Cleare as *Cold Water*.

Experiment  
Solitary, touch-  
ing the  
different  
Heats of Fire  
and Boiling  
Water.

683

**F**ire burneth *Wood*, making it first *Luminous*; Then *Black* and *Brittle*; And lastly, *Broken* and *Incinerate*: *Scalding Water* doth none of these. The Cause is, for that by *Fire*, the *Spirit* of the *Body* is first *Refined*, and then *Emitted*; Whereof the *Refining*, or *Attenuation* causeth the *Light*; And the *Emission*, first the *Fragilitie*, and after the *Dissolution* into *Ashes*: Neither doth any other *Body* enter: But in *Water* the *Spirit* of the *Body* is not *Refined* so much; And besides *Part* of the *Water* entreth; Which doth increase the *Spirit*, and in a degree extinguish it: Therefore wee see that *Hot Water* will quench *Fire*. And againe wee see, that in *Bodies*, wherein the *Water* doth not much enter, but onely the *Heat* passeth, *Hot Water* worketh the Effects of *Fire*: As in *Egges* Boiled, and *Roasted*, (into which the *Water* entreth not at all,) there is scarce difference to be discerned; But in *Fruit*, and *Flesh*, whereinto the *Water* entreth, in some *Part*, there is much more difference.

Experiment  
Solitary, touch-  
ing the  
Qualification  
of Heat by  
Moisture.

684

**T**he *Bottom* of a *Vessel* of *Boiling Water*, (as hath beene observed,) is not very much *Heated*, So as Men may put their *Hand* under the *Vessel*, and remove it. The Cause is, for that the *Moisture* of *Water*, as it quencherh *Coales*, where it entreth; So it doth allay *Heat*, where it toucheth: And therefore note well, that *Moisture*, although it doth not passe thorow *Bodies*, without *Communication* of some *Substance*, (As *Heat* and *Cold* doe;) yet it worketh manifest Effects; not by *Entrance* of the *Body*, but by *Qualifying* of the *Heat*, and *Cold*; As we see in this *Instance*: And we see likewise, that the *Water* of *Things* distilled in *Water*, (which they call the *Bath*) differeth not much from the *Water* of *Things* Distilled by *Fire*: We see also, that *Pewter-Dishes*, with *Water* in them, will not Melt easily; But without it, they will; Nay we see more, that *Butter*, or *Oile*, which in themselves are *Inflammable*, yet by the *Vertue* of their *Moisture*; will doe the like.

Experiment  
Solitary, touch-  
ing *Tawning*.

685

**I**T hath beene noted by the *Ancients*, that it is dangerous to *Picke* ones *Eare*, whilst he *Tawne*th. The Cause is, for that in *Tawning*, the *Inner Parchment* of the *Eare* is extended, by the *Drawing* in of the *Spirit*, and *Breath*; For in *Tawning*, and *Sighing* both, the *Spirit* is first strongly *Drawne* in, and then strongly *Expelled*.

Experiment  
Solitary, touch-  
ing the  
*Hiccough*.

686

**I**T hath beene observed by the *Ancients*, that *Sneezing* doth cease the *Hiccough*. The Cause is, for that the *Motion* of the *Hiccough* is a *Lifting* up of the *Stomacke*; which *Sneezing* doth somewhat deprese, and divert the *Motion* another way. For first we see, that the *Hiccough* commeth of *Fulnesse* of *Meat*, (especially in *Children*;) which causeth an *Extension* of the *Stomacke*: Wee see also, it is caused by *Acide Meats*, or *Drinkes*, which is by the *Pricking* of the *Stomack*: And this *Motion* is ceased either by *Diversion*, Or by *Detention* of the *Spirits*: *Diversion*, as in *Sneezing*; *Detention*, as wee see *Holding* of the *Breath*, doth helpe somewhat to cease the *Hiccough*: And putting a *Man* into an *Earnest Study* doth the like: As is commonly used: And *Vinegar* put to the *Nostrils*, or *Gargarized*, doth it also; For that it is *Astringent*, and inhibiteth the *Motion* of the *Spirit*.

Experiment  
Solitary, touch-  
ing *Sneezing*.

687

**L**ooking against the *Sunne*, doth induce *Sneezing*. The Cause is, not the *Heating* of the *Nostrils*; For then the holding up of the *Nostrils* against the



the *Sunne*, though one *Vinke*, would doe it; But the *Drawing* downe of the *Moisture* of the *Brain*: For it will make the *Eyes* runne with *Water*; And the *Drawing* of *Moisture* to the *Eyes*, doth draw it to the *Nosthrills*, by *Motion* of *Consent*; And so followeth *Sneezing*; As contrariwise, the *Tickling* of the *Nosthrills* within, doth draw the *Moisture* to the *Nosthrills*, and to the *Eyes* by *Consent*; For they also will *Water*. But yet, it hath beene observed, that if one be about to *Sneeze*, the *Rubbing* of the *Eyes*, till they runne with *Water*, will prevent it. Whereof the *Cause* is, for that the *Humour*, which was descending to the *Nosthrills*, is diverted to the *Eyes*.

**T**He *Teeth* are more, by *Cold Drinke*, or the like, affected, than the other *Parts*. The *Cause* is double, The One, for that the *Resistance* of *Bone* to *Cold*, is greater than of *Flesh*; for that the *Flesh* shrinketh, but the *Bone* resisteth, whereby the *Cold* becommeth more eager: The Other is, for that the *Teeth*, are *Parts* without *Bloud*; Whereas *Bloud* helpeth to qualifie the *Cold*: And therefore we see, that the *Sinewes* are much affected with *Cold*; For that they are *Parts* without *Bloud*: So the *Bones* in Sharpe *Colds* waxe *Brittle*: And therefore it hath beene seene, that all *Contusions* of *Bones*, in *Hard Weather*, are more difficult to *Cure*.

**I**T hath beene noted, that the *Tongue* receiveth, more easily, *Tokens* of *Diseases*, than the other *Parts*; As of *Heats* within, which appeare most in the *Blacknesse* of the *Tongue*. Again, *Pied Cattell* are spotted in their *Tongues*, &c. The *Cause* is, (no doubt,) the *Tendernesse* of the *Part*, which thereby receiveth more easily all *Alerations*, than any other *Parts* of the *Flesh*.

**W**Hen the *Mouth* is out of *Taste*, it maketh *Things* taste, sometimes *Salt*; Chiefly *Bitter*; And sometimes *Loathsome*; But never *Sweet*. The *Cause* is, the *Corrupting* of the *Moisture* about the *Tongue*; Which many times turneth *Bitter*, and *Salt*, and *Loathsome*; But *Sweet* never; For the rest are *Degrees* of *Corruption*.

**I**T was observed in the *Great Plague* of the last *Yeare*, that there were seene, in divers *Ditches*, and low *Grounds*, about *London*, many *Toads*, that had *Tailes*, two or three *Inches* long, at the least; Whereas *Toads* (usually) have no *Tailes* at all. Which argueth a great *Disposition* to *Purefaction* in the *Soile* and *Aire*. It is reported likewise, that *Roots*, (such as *Carrets*, and *Parsnips*;) are more *Sweet*, and *Lushious*, in *Infectious Yeares*, than in other *Yeares*.

**W**He *Physicians* should with all diligence inquire, what *Simples* Nature yeeldeth, that have extreme *Subtile Parts*, without any *Mordication*, or *Acrimony*: For they undermine that which is *Hard*; They open that which is *Stopped*, and *Shut*; And they expell that which is *Offensive*, gently; without too much *Perturbation*. Of this Kind are *Elder-Flowers*, which therefore are Proper for the *Stone*: Of this Kinde is the *Dwarfe-Pine*; which is Proper for the *Iaundies*: Of this Kinde is *Harts-Horne*: which is Proper for *Agues*, and *Infections*: Of this Kinde is *Piony*; which is Proper for *Stoppings* in the *Head*: Of this Kinde is *Fumitory*; which is Proper for the *Spleen*: And a Number of others. Generally, divers *Creatures* bred of *Purefaction*, though they be somewhat loathsome to take, are of this kinde; As *Earth-Wormes*, *Timber-Sowes*, *Snails*, &c. And I conceive, that the *Trochisks* of *Vipers*, (which are so much magnified,) and the *Flesh* of *Snakes* some wayes condited,

Experiment  
Solitary, touching the  
Tendernesse of  
the Teeth.  
688

Experiments  
Solitary, touching the  
Tongue.  
689

Experiment  
Solitary touching the  
Taste.  
690

Experiment  
Solitary, touching some  
Prognosticks  
of Pestilentiall  
Seasons.  
691

Experiment  
Solitary, touching Speciall  
Simples for  
Medicines.  
692



condited, and corrected, (which of late are growne into some Credite,) are of the same Nature. So the *Parts of Beasts Purified*; (as *Castoreum*, and *Musk*, which have extreme *Subrill Parts*,) are to be placed amongst them. We see also that *Purefaction of Plants*, (as *Agaricke*, and *Jewel-Eare*,) are of greatest Vertue. The Cause is, for that *Putrefaction* is the Subtilest of all *Motions*, in the *Parts of Bodies*: And since we cannot take downe the *Lives of Living Creatures*, (which some of the *Paracelsians* say (if they could bee taken downe,) would make us *Immortall*,) the Next is for *Subtiltie of Operation*, to take *Bodies Purified*; Such as may be safely taken.

Experiments  
in Consort,  
touching  
*Venus*.

693

IT hath beene observed by the *Ancients*, that *Much Use of Venus* doth *Dim the Sight*; And yet *Eunuchs*, which are unable to generate are (neverthelessse) also *Dimme-Sighted*. The Cause of *Dimnesse of Sight*, in the Former, is the *Expence of Spirits*: In the Later, the *Over-moisture of the Braine*: For the *Over-Moisture of the Braine* doth thicken the *Spirits Visuall*, and obstructeth their *Passages*; As we see by the *Decay*, in the *Sight*, in *Age*; Where also the *Diminution of the Spirits* concurrerth as another Cause: wee see also that *Blindnesse* commeth by *Rheumes*, and *Cataracts*. Now in *Eunuchs*, there are all the *Notes of Moisture*; As the *Swelling of their Thighes*, the *Loosenesse of their Belly*, the *Smoothnesse of their Skinne*, &c.

694

The *Pleasure in the Act of Venus*, is the greatest of the *Pleasures of the Senses*; The *Matching of it with Itch* is improper; though that also be *Pleasing to the touch*. But the *Causes are Profound*. First, all the *Organs of the Senses* qualifieth the *Motions of the Spirits*; And make so many *Severall Species of Motions*, and *Pleasures or Displeasures* thereupon, as there be *Diversities of Organs*. The *Instruments of Sight, Hearing, Taste, and Smell*, are of severall frame; And so are the *Parts for Generation*. Therefore *Scaliger* doth well, to make the *Pleasure of Generation* a *Sixth Sense*; And if there were any other differing *Organs, & Qualified Perforations*, for the *Spirits* to passe; there would be more than the *Five Senses*: Neither doe wee well know, whether some *Beasts and Birds*, have not *Senses* that we know not; And the very *Sent of Dogs* is almost a *Sense* by it selfe. Secondly, the *Pleasures of the Touch*, are greater and deeper, than those of the other *Senses*; As we see in *Warming upon Cold*; Or *Refrigeration upon Heat*: For as the *Paines of the Touch*, are greater than the *Offences of other Senses*; So likewise are the *Pleasures*. It is true, that the *Affecting of the Spirits immediately*, and (as it were) without an *Organ*, is of the greatest *Pleasure*; Which is but in two things: *Sweet Smells*; And *Wine*, and the like *Sweet Vapours*. For *Smells*, we see their great and sudden *Effect* in fetching *Men* againe, when they swoone: For *Drinke*, it is certaine, that the *Pleasure of Drunkennesse*, is next the *Pleasure of Venus*: And *Great Ioyes* (likewise) make the *Spirits* move, and touch themselves: And the *Pleasure of Venus* is somewhat of the same Kinde.

695

It hath beene alwayes observed, that *Men* are more inclined to *Venus* in the *Winter*, and *Women* in the *Summer*. The Cause is, for that the *Spirits*, in a *Body* more *Hot and Drie*, (as the *Spirits of Men* are,) by the *Summer* are more *exhaled*, and *dissipated*; And in the *Winter* more *condensed*, and kept entire: But in *Bodies* that are *Cold and Moist*, (as *womens* are,) the *Summer* doth *Cherish the Spirits*, and calletth them forth; the *Winter* doth dull them. Furthermore, the *Abstinence, or Intermision of the use of Venus*, in *Moist and well habituate Bodies*, breedeth a *Number of Diseases*; And especially dangerous *Impostumations*. The Reason is evident; For that it is a *Principall Evacuation*, especially of the *Spirits*: For of the *Spirits*, there is scarce any *Evacuation*, but



but in *Venus*, and *Exercise*. And therefore the *Omission* of either of them, breedeth all *Diseases* of *Repletion*.

The *Nature* of *Vivification* is very worthy the Enquiry: And as the *Nature* of *Things*, is commonly better perceived, in *Small*, than in *Great*; and in *unperfect*, than in *perfect*; and in *Parts*, than in *whole*: So the *Nature* of *Vivification* is best enquired in *Creatures* bred of *Putrefaction*. The *Contemplation* whereof hath many *Excellent Fruits*. First, in *Disclosing* the *Originall* of *Vivification*. Secondly, in *Disclosing* the *Originall* of *Figuration*. Thirdly, in *Disclosing* many *Things* in the *Nature* of *Perfect Creatures*, which in them lie more hidden. And Fourthly, in *Traducing*, by way of *Operation*, some *Observations* in the *Insecta*, to work *Effects* upon *Perfect Creatures*. Note that the word *Insecta* agreeth not with the *Matter*, but we ever use it for *Brevities* sake, intending by it *Creatures* bred of *Putrefaction*.

The *Insecta* are found to breed out of severall *Matters*: Some breed of *Mul*, or *Dung*; As the *Earth-wormes*, *Eeles*, *Snakes*, &c. For they are both *Putrefactions*: For *Water* in *Mud* doth *Putrifie*, as not able to *Preserve* it self: And for *Dung*, all *Excrements* are the *Refuse* and *Putrefactions* of *Nourishment*. Some breed in *Wood*, both *Growing* and *Cut downe*. *Quere* in what *Woods* most, and at what *Seasons*? We see that the *Wormes* with many *Feet*, which round themselves into *Balls*, are bred chiefly under *Logs* of *Timber*, but not in the *Timber*; And they are said to bee found also, (many times,) in *Gardens*, where no *Logs* are. But it seemeth their *Generation* requireth a *Coverture*, both from *Sunne*, and *Raine*, or *Dew*; As the *Timber* is. And therefore they are not *Venomous*, but (contrariwise) are held by the *Physicians* to *clarifie* the *Blood*. It is observed also that *Cimices* are found in the *Holes* of *Red-Sides*. Some breed in the *Haire* of *Living Creatures*; As *Lice*, and *Ticks*, which are bred by the *Sweat* close kept, and somewhat *arefied* by the *Haire*. The *Excrements* of *Living Creatures*, doe not onely breed *Insecta*, when they are *Excerned*, but also while they are in the *Body*; As in *Wormes* whereto *Children* are most subject, and are chiefly in the *Guts*. And it hath beene lately observed by *Physicians*, that in many *Pestilent Diseases*, there are *Wormes* found in the upper *Parts* of the *Body*, where *Excrements* are not, but onely *Humours* *Putrified*. *Fleas* breed principally of *Straw* or *Mats*, where there hath beene a little *Moisture*; Or the *Chamber* and *Bed-straw* kept close, and not *Aired*. It is received that they are killed by *Strewing* *Worme-wood* in the *Rooms*. And it is truly observed, that *Bitter Things* are apt, rather to kill, than engender *Putrefaction*; And they be *Things* that are *Fat*, or *Sweet*, that are aptest to *Putrifie*. There is a *Worme*, that breedeth in *Meale*, of the shape of a large white *Maggot*, which is given as a great dainty to *Nightingales*. The *Moth* breedeth upon *Cloth*, and other *Lanifices*; Especially if they be laid up *darkish*, and *wet*. It delighteth to be about the *Flame* of a *Candle*. There is a *Worme* called a *Wewill*, bred under *Ground*, and that feedeth upon *Roots*; As *Parsnips*, *Carrets*, &c. Some breed in *Waters*, especially shaded, but they must be *Standing Waters*; As the *Water-Spider*, that hath six *Legs*. The *Flic* called the *Gad-flie*, breedeth of somewhat that *Swimmeth* upon the *Top* of the *Water*, and is most about *Ponds*. There is a *Worme* that breedeth of the *Dregs* of

Experiments  
in Confort,  
touching the  
*Insecta*.

696

800



of *Wine* Decayed; which afterwards, (as is observed by some of the *Ancients*;) turneth into a *Gnat*. It hath beene observed by the *Ancients*, that there is a *Worme* that breedeth in old *Snow*, and is of Colour Reddish, and dull of Motion, and dyeth soone after it commeth out of *Snow*. Which should shew, that *Snow* hath in it a secret *Warmth*; For else it could hardly Vivifie. And the Reason of the Dying of the *Worme*, may be the sudden Exhaling of that little *Spirit*, as soon as it commeth out of the *Cold*, which had shut it in. For as *Butterflies* quicken with *Heat*, which were benumbed with *Cold*; So *Spirits* may exhale with *Heat*, which were Preserved in *Cold*. It is affirmed both by the *Ancient* and *Moderne Observation*, that in *Furnaces* of *Copper*, and *Brasse*, where *Chalcites*, (which is *Vitrioll*), is often cast in, to mend the working, there riseth suddenly a *Flie*, which sometimes moveth, as if it tooke hold on the walls of the *Furnace*; Sometimes is seene moving in the *Fire* below; And dieth presently, as soone as it is out of the *Furnace*. Which is a Noble Instance, and worthy to be weighed; for it sheweth that as well *Violent Heat* of *Fire*, as the *Gentle Heat* of *Living Creatures*, will Vivifie, if it have Matter Proportionable. Now the great *Axiome* of *Vivification* is, that there must bee *Heat* to dilate the *Spirit* of the *Body*; An *Active Spirit* to be dilated; *Matter Viscous* or *Tenacious*, to hold in the *Spirit*; And that *Matter* to be put forth, and *Figured*. Now a *Spirit* dilated by so ardent a *Fire*, as that of the *Furnace*, as soone as ever it cooleth never so little, congealeth presently. And (no doubt) this *Action* is furthered by the *Chalcites*, which hath a *Spirit*, that will put forth and germinate, as we see in *Chymicall Trials*. Briefly, most *Things Putrified* bring forth *Insecta* of severall Names; But wee will not take upon us now, to Enumerate them all.

The *Insecta* have beene noted by the *Ancients*, to feed little: But this hath not beene diligently observed; For *Grashoppers* eat up the *Greene* of whole *Countries*; And *Silke-Wormes* devoure *Leaves* swiftly; And *Ants* make great Provision. It is true, that *Creatures*, that Sleep and rest much, Eat little; As *Dormise*, and *Bats*, &c. They are all without *Bloud*: Which may be, for that the *Juyce* of their *Bodies*, is almost all one; Not *Bloud*, and *Flesh*, and *Skin*, and *Bone*, as in *Perfect Creatures*; The *Integrall Parts* have Extreme Varietie, but the *Similar Parts* little. It is true, that they have, (some of them,) a *Diaphragme*, and an *Inestina*; And they have all *Skins*; Which in most of the *Insecta* are cast often. They are not (generally) of long *Life*: Yet *Bees* have beene knowne to live seven yeares: And *Snakes* are thought, the rather for the *Casting* of their *Spoile*, to live till they be Old: And *Eeles*, which many times breed of *Putrefaction*, will live and grow very long: And those that Enterchange from *Wormes* to *Flies* in the *Summer*, and from *Flies* to *Wormes* in the *Winter*, have been kept in *Boxes* foure yeares at the least. Yet there are certaine *Flies*, that are called *Ephemera*, that live but a day. The Cause is, the Exilitie of the *Spirit*; Or perhaps the Absence of the *Sunne*, For that if they were brought in, or kept close, they might live longer. Many of the *Insecta*, (as *Butterflies*, and other *Flies*;) revive easily, when they seeme dead, being brought to the *Sunne*, or *Fire*. The Cause whereof is, the Diffusion of the *Vitall Spirit*, and the easie dilating of it by a little *Heat*. They stirre a good while, after their *Heads* are off, or that they be cut in *Pieces*; Which is caused also, for that their *Vitall Spirits* are more diffused thorow-out all their *Parts*, and lesse confined to *Organs*, than in *Perfect Creatures*.

The *Insecta* have *Voluntarie Motion*, and therefore *Imagination*; And whereas some of the *Ancients* have said, that their *Motion* is Indeterminate, and their *Imagination* Indefinite, it is negligently observed; For *Ants* goe right forwards



forwards to their Hills; And *Bees* doe (admirably) know the way, from a Flowrie Heath, two or three Miles off, to their Hives. It may be, *Gnats*, and *Flies*, have their *Imagination* more mutable, and giddy, as *Small Birds* likewise have. It is said by some of the *Ancients*, that they have onely the *Sense* of *Feeling*; which is manifestly untrue; For if they goe forth right to a Place, they must needs have *Sight*: Besides, they delight more in one *Flower*, or *Herb*, than in another, and therefore have *Taste*: And *Bees* are called with *Sound* upon *Brasse*, and therefore they have *Hearing*: Which sheweth likewise that though their *Spirit* be diffused, yet there is a *Seat* of their *Senses* in their *Head*.

Other Observations concerning the *Insecta*, together with the Enumeration of them, we referre to that place, where we meane to handle the Title of *Animal's* in generall.

**A** Man Leapeth better with *Weights*, in his *Hands*, than without. The Cause is, for that the *Weight*, (if it bee proportionable,) strengtheneth the *Sinewes*, by Contracting them. For otherwise, where no *Contraction* is needfull, *Weight* hindreth. As we see in *Horse-Races*, *Men* are curious to fore-see, that there be not the least *Weight*, upon the one *Horse*, more than upon the other. In *Leaping* with *Weights*, the *Armes* are first cast backwards, and then forwards, with so much the greater Force: For the *Hands* goe backward before they take their Raife. *Quere*, if the contrary *Motion* of the *Spirits*, immediately before the *Motion* we intend, doth not cause the *Spirits*, as it were to breake forth with more Force: As *Breath* also drawne, and kept in, cometh forth more forcibly: And in *Casting* of any *Thing*, the *Armes*, to make a greater *Swing*, are first cast backward.

**O**F *Musicall Tones*, and *Vaequall Sounds*, wee have spoken before; But touching the *Pleasure*, and *Displeasure* of the *Senses*, not so fully. *Harsh Sounds*, as of a *Saw*, when it is sharpened; *Grinding* of one *Stone* against another; *Squeaking*, or *Skrieking Noise*; make a *Shivering* or *Horror* in the *Body*, and set the *Teeth* on edge. The Cause is, for that the *Objects* of the *Eare*, do affect the *Spirits* (immediately) most with *Pleasure* and *Offence*. We see, there is no *Colour* that affecteth the *Eye* much with *Displeasure*: There bee *Sights*, that are *Horrible*, because they excite the *Memory* of *Things* that are *Odious*, or *Fearfull*; But the same *Things Painted* do little affect. As for *Smells*, *Tastes*, and *Touches*, they be *Things* that doe affect, by a *Participation*, or *Impulsion* of the *Body*, of the *Object*. So it is *Sound* alone, that doth immediately, and incorporeally affect most: This is most manifest in *Musicke*; and *Concords* and *Discords* in *Musicke*: For all *Sounds*, whether they be sharp, or Flat, if they be Sweet, have a *Roundnesse* and *Equality*; And if they be Harsh, are *Vnequall*: For a *Discord* it selfe is but a *Harshnesse* of *Divers Sounds Meeting*. It is true, that *Inequality*, not Stayed upon, but *Passing*, is rather an *Encrease* of *Sweetnesse*; As in the *Purling* of a *Wreathed String*; And in the *Raucity* of a *Trumpet*; And in the *Nightingale-Pipe* of a *Regall*; And in a *Discord* straight falling upon a *Concord*: But if you stay upon it, it is *Offensive*; And therefore, there be these three *Degrees* of *Pleasing*, and *Displeasing* in *Sounds*; *Sweet Sounds*; *Discords*; and *Harsh Sounds*, which we call by divers Names, as *skrieking*, or *Grating*, such as wee now speake of. As for the *Setting* of the *Teeth* on *Edge*, we plainly see what an *Intercourse* there is, between the *Teeth*, and the *Organ* of the *Hearing*, by the *Taking* of the *End* of a *Bow*, between the *Teeth*, and *Striking* upon the *String*.

Experiment  
Solitary, touching  
Leaping.  
696

Experiment  
Solitary, touching the  
Pleasures, and  
Displeasures of  
the Senses,  
especially of  
Hearing.  
700









# NATVRALL HISTORIE.

## VIII. Century.

**T**Here be *Mineralls*, and *Fossiles*, in great Variety; But of *Veines* of *Earth Medicinall*, but few; The Chiefe are, *Terra Lemnia*, *Terra Sigillata communis*, and *Bolus Arminus*: Whereof *Terra Lemnia* is the Chiefe. The *Virtues* of them are, for *Curing* of *wounds*, *Stanching* of *Bloud*, *Stopping* of *Fluxes* and *Rheumes*, and *Arresting* the *Spreading* of *Poison*, *Infection*, and *Purefaction*: And they have of all other *Simples*, the *Perfectest* and *Purest* *Qualitie* of *Drying*, with little or no *Mixture* of any other *Quality*. Yet it is true, that the *Bole-Arminick* is the most *Cold* of them; And that *Terra Lemnia* is the most *Hot*; For which Cause, the *Island Lemnos*, where it is digged, was in the Old *Fabulous Ages* consecrated to *Vulcan*.

**A**Bout the *Bottom* of the *Straights* are gathered great *Quantities* of *Sponges*, which are gathered from the *sides* of *Rockes*, being as it were a large, but tough, *Mosse*. It is the more to be noted, because that there bee but few *Substances*, *Plant-like*, that grow deep within the *Sea*; For they are gathered sometimes fifteen *Fathome* deepe; And when they are laid on *Shoare*, they seeme to be of great *Bulke*; But crushed together, will be transported in a very small *Room*.

**I**T seemeth, that *Fish*, that are used to the *Sali-Water*, doe nevertheless delight more in *Fresh*. We see, that *Salmons*, and *Smelts* love to get into *Rivers*, though it be against the *Stream*. At the *Haven* of *Constantinople*, you shall have great *Quantities* of *Fish* that come from the *Euxine-Sea*; that when they come into the *Fresh water*, doe inebriate and turne up their *Bellies*; So as you may take them with your *Hand*. I doubt, there hath not beene sufficient Ex-

Experiment  
Solitary, tou-  
ching *Veines*  
of *Medicinall*  
*Earth*.

701

Experiment  
Solitary, tou-  
ching the  
Growth of  
*Sponges*.

702

Experiment  
Solitary, tou-  
ching *Sea-*  
*Fish* put in  
*Fresh Waters*.

703



periment made of Putting *Sea-Fish* into *Fresh Water*, *Ponds*, and *Pooles*. It is a Thing of great Use, and Pleasure: For so you may have them new at some good distance from the *Sea*: And besides, it may bee, the *Fish* will eat the pleasanter, and may fall to breed: And it is said that *Colchester Oysters*, which are put into Pits, where the *Sea* goeth and commeth, (but yet so, that there is a *Fresh Water* comming also to them, when the *Sea* voideth,) become by that meanes Fatter, and more Growne.

Experiment  
Solitary, touch-  
ing Attraction by Similitude of Substance.

704

**T**He *Turkish-Bow* giveth a very Forcible Shoot; Infomuch as it hath beene knowne, that the *Arrow* hath pierced a *Steele Target*, or a *Peece of Brasse* of two Inches thicke: But that which is more strange, the *Arrow*, if it be Headed with *Wood*, hath beene knowne to pierce thorow a *Peece of Wood*, of eight Inches thicke. And it is certaine, that we had in use at one time, for *Sea-Fight*, short *Arrowes*, which they called *Sprights*, without any other Heads, save *Wood* sharpened; which were discharged out of *Muskets*, and would pierce thorow the Sides of *Ships*, where a *Bullet* would not pierce. But this dependeth upon one of the greatest *Secrets* in all *Nature*; Which is, that *Similitude of Substance* will cause *Attraction*, where the Body is wholly freed from the *Motion of Gravity*: For if that were taken away, *Lead* would draw *Lead*, and *Gold* would draw *Gold*, and *Iron* would draw *Iron*, without the help of the *Load-Stone*. But this same *Motion of Weight* or *Gravitie*, (which is a meere *Motion of the Matter*, and hath no *Affinity* with the *Forme*, or *Kinde*,) doth kill the other *Motion*, except it selfe bee killed by a violent *Motion*; And in these *Instances of Arrowes*; For then the *Motion of Attraction* by *Similitude of Substance*, beginneth to shew it selfe. But we shall handle this *Point of Nature* fully in due Place.

Experiment  
Solitary, touch-  
ing certaine  
Drinckes in  
Turkey.

705

**T**Hey have in *Turkey*, and the *East*, certaine *Confectiones*, which they call *Servets*, which are like to *Candied Conserves*; And are made of *Sugar* and *Lemons*, or *Sugar* and *Citrons*, or *Sugar* and *Violets*, and some other *Flowers*; And some Mixture of *Amber* for the more delicate Persons; And those they dissolve in *Water*, and thereof make their *Drinke*, because they are forbidden *Wine* by their *Law*. But I doe much marvell, that no *Englishman*, or *Dutchman*, or *German*, doth set up *Brewing* in *Constantinople*; Considering they have such Quantity of *Barley*. For as for the generall Sort of *Men*, *Frugality* may be the Cause of *Drinking water*; For that it is no small Saving, to pay nothing for ones *Drinke*: But the better Sort might well be at the Cost. And yet I wonder the lesse at it, because I see *France*, *Italy*, or *Spaine*, have not taken into use, *Beere*, or *Ale*; Which (perhaps) if they did, would better both their *Healths*, and their *Complexions*. It is likely it would be Matter of great *Gain* to any, that should begin it in *Turkey*.

Experiments  
in Confort  
touching  
Sweat.

706

**I**N *Bathing in Hot Water*, *Sweat* (neverthelesse) commeth not in the *Parts Under the water*. The Cause is; First, for that *Sweat* is a *Kinde of Colliquation*. And that *Kinde of Colliquation* is not made, either by an *Over-Drie Heat*, or an *Over-Moist Heat*. For *Over-Moisture* doth somewhat extinguish the *Heat*; As wee see that even *Hot-Water* quencketh *Fire*: And *Over-Drie Heat* shutteth the *Pores*: And therefore *Men* will sooner *Sweat* covered before the *Sunne*, or *Fire*, than if they stood naked; And *Earthen Bottles*, filled with *Hot Water*, doe provoke, in Bed, a *Sweat* more daintily, than *Brick-Bats* Hot. Secondly, *Hot Water* doth cause *Evaporation* from the *Skin*: So as it spendeth the Matter, in those *Parts under the Water*, before it issueth in

Sweat.



*Sweat*. Again, *Sweat* commeth more plentifully, if the *Heat* bee increased by *Degrees*, than if it be greatest at first, or equall. The *Cause* is, for that the *Pores* are better opened by a *Gentle Heat*, than by a more *Violent*; And by their opening the *Sweat* issueth more abundantly. And therefore *Physitians* may doe well, when they provoke *Sweat* in Bed, by *Bottles*, with a *Decoction* of *Sudorifick Herbs* in *Hot Water*, to make two *Degrees* of *Heat* in the *Bottles*; And to lay in the Bed, the lesse *Heated* first, and after halfe an *Houre* the more *Heated*.

*Sweat* is *Salt* in Taste; The *Cause* is, for that, that *Part* of the *Nourishment*, which is *Fresh* and *Sweet*, turneth into *Bloud*, and *Flesh*; And the *Sweat* is onely that *Part*, which is *Separate*, and *Excerned*. *Bloud* also *Raw*, hath some *Salt-nesse*, more than *Flesh*; because the *Assimilation* into *Flesh*, is not without a little and subtile *Excretion* from the *Bloud*.

*Sweat* commeth forth more out of the *Vpper Parts* of the *Body*, than the *Lower*; The *Reason* is, because those *Parts* are more replenished with *Spirits*; And the *Spirits* are they that put forth *Sweat*: Besides, they are lesse *Fleshy*, and *Sweat* issueth (chiefly) out of the *Parts* that are lesse *Fleshy*, and more *Drie*; As the *Forehead*, and *Breast*.

Men *Sweat* more in *Sleepe*, than *Waking*; And yet *Sleep* doth rather stay other *Fluxions*, than cause them; As *Rheumes*, *Loosenesse* of the *Body*, &c. The *Cause* is, for that in *Sleepe*, the *Heat*, and *Spirits* doe naturally move inwards, and there rest. But when they are collected once within, the *Heat* becometh more *Violent*, and *Irritate*; And thereby expelleth *Sweat*.

*Cold Sweats* are (many times) *Mortall*, and neare *Death*; And alwayes *Ill*, and *suspected*; As in *Great Feares*, *Hypochondriacall Passions*, &c. The *Cause* is, for that *Cold Sweats* come by a *Relaxation* or *Forsaking* of the *Spirits*, whereby the *Moisture* of the *Body*, which *Heat* did keepe firme in the *Parts*, fevereth, and issueth out.

In those *Diseases* which cannot be discharged by *Sweat*, *Sweat* is *ill*, and rather to bee stayed; As in *Diseases* of the *Lungs*, and *Fluxes* of the *Belly*; But in those *Diseases*, which are expelled by *Sweat*, it causeth and lighteneth; As in *Agues*, *Pestilences*, &c. The *Cause* is, for that *Sweat* in the Latter Sort is partly *Criticall*, and sendeth forth the *Matter* that offendeth; But in the Former, it either proceedeth from the *Labour* of the *Spirits*, which sheweth them *Oppressed*; Or from *Motion* of *Consent*, when *Nature* not able to expell the *Disease*, where it is seated, moveth to an *Expulsion* indifferent over all the *Body*.

THE *Nature* of the *Glo-worme* is hitherto not well observed. Thus much we see; That they breed chiefly in the *Hottest Months* of *Summer*, And that they breed not in *Champaigne*, but in *Bushes*, and *Hedges*. Whereby it may be conceived, that the *Spirit* of them is very fine, and not to be refined, but by *Summer Heats*: And againe, that by reason of the *Finenesse*, it doth easily exhale. In *Italy*, and the *Hottier Countries*, there is a *Flie* they call *Lucciole*, that shineth as the *Glo-worme*, doth; And it may be is the *Flying Glo-worme*. But that *Flie* is chiefly upon *Fens*, and *Marrishes*. But yet the two former *Observations* hold; For they are not seene, but in the *Heat* of *Summer*; And *Sedge*, or other *Greene* of the *Fens*, give as good *Shade*, as *Bushes*. It may be the *Glo-wormes* of the *Cold Countries* ripen not so farre as to be *Winged*.

THE *Passions* of the *Minde*, worke upon the *Body* the *Impressions* following. *Feare* causeth *Palenesse*; *Trembling*; The *Standing* of the *Haire* upright;

707

708

709

710

711

Experiment  
Solitary, touch-  
ing the  
*Glo-worme*.

712

Experiments  
in Confort,  
touching the  
*Impressions*,  
which the  
*Passions* of the  
*Minde* make  
upon the  
*Body*.

713



right; Starting; and Screeching. The Paleness is caused, for that the Blood runneth inward, to succour the Heart. The Trembling is caused, for that through the Flight of the Spirits inward, the Outward Parts are destituted, and not sustained. Standing upright of the Haire is caused, for that by Shutting of the Pores of the Skin, the Haire that lyeth allope, must needs Rise. Starting is both an Apprehension of the Thing feared; (And, in that kinde, it is a Motion of Shrinking;) And likewise an Inquisition, in the beginning, what the Matter should be; (And in that kinde it is a Motion of Erection;) And therefore, when a Man would listen suddenly to any Thing, he Starteth; For the Starting is an Erection of the Spirits to attend. Screeching is an Appetite of Expelling that which suddenly striketh the Spirits: For it must bee noted, that many Motions, though they bee unprofitable to expell that which hurteth, yet they are Offers of Nature, and cause Motions by Consent; As in Groaning, or Crying upon Paine.

714

Griefe, and Paine cause Sighing; Sobbing; Groaning; Screaming; and Roaring; Teares; Distorting of the Face; Grinding of the Teeth; Sweating. Sighing is caused by the Drawing in of a greater Quantity of Breath to refresh the Heart that laboureth: like a great Draught when one is thirsty. Sobbing is the same Thing stronger. Groaning, and Screaming, and Roaring, are caused by an Appetite of Expulsion, as hath beene said: For when the Spirits cannot expell the Thing that hurteth, in their Strife to doe it, by Motion of Consent, they expell the Voice. And this is, when the Spirits yeeld, and give over to resist; For if one doe constantly resist Paine, he will not groane. Teares are caused by a Contraction of the Spirits of the Braine; Which Contraction by consequence astringeth the Moisture of the Braine, and thereby sendeth Teares into the Eyes. And this Contraction, or Compression causeth also Wringing of the Hands; For Wringing is a Gesture of Expression of Moisture. The Distorting of the Face is caused by a Contention, first to beare and resist, and then to expell; Which maketh the Parts knit first, and afterwards open. Grinding of the Teeth is caused (likewise) by a Gathering and Serring of the Spirits together to resist; Which maketh the Teeth also to set hard one against another. Sweating is also a Compound Motion by the Labour of the Spirits, first to resist, and then to expell.

715

Ioy causeth a Chearefulness and Vigour in the Eyes; Singing; Leaping; Dancing; And sometimes Teares. All these are the effects of the Dilation, and Comming forth of the Spirits into the Outward Parts; Which maketh them more Lively, and Stirring. We know it hath beene scene, that Excessive sudden Ioy hath caused Present Death, while the Spirits did spread so much, as they could not retire againe. As for Teares, they are the Effects of Compression of the Moisture of the Braine, upon Dilation of the Spirits. For Compression of the Spirits worketh an Expression of the Moisture of the Braine, by Consent, as hath beene said in Griefe. But then in Ioy, it worketh it diversly; viz. by Propulsion of the Moisture, when the Spirits dilate, and occupie more Roome.

716

Anger causeth Paleness in some, and the Going and Comming of the Colour in Others: Also Trembling in some; Swelling; Foaming at the Mouth; Stamping; Bending of the Fist. Paleness, and Going, and Comming of the Colour, are caused by the Burning of the Spirits about the Heart; Which to refresh themselves, call in more Spirits from the Outward Parts. And if the Paleness be alone, without Sending forth the Colour againe, it is commonly joyned with some Feare; But in many there is no Paleness at all, but contrariwise Redness about the Cheekes, and Gills; Which is by the Sending forth of the

Spirits



*Spirits* in an Appetite to Revenge. Trembling in Anger is likewise by a Calling, in of the *Spirits*; And is commonly, when Anger is joyned with Feare. Swelling is caused, both by a Dilatation of the *Spirits* by Over-Heating, and by a Liquefaction or Boiling of the *Humours* thereupon. Foaming at the Mouth is from the same Cause, being an Ebullition, Stamping, and Bending of the *Fist*, are caused by an Imagination of the *Act* of Revenge.

Light Displeasure or Dislike, causeth Shaking of the Head; Frowning, and Knitting of the Browes. These Effects arise from the same Causes that Trembling, and Horrore doe; Namely, from the Retiring of the *Spirits*, but in a lesse degree. For the Shaking of the Head is but a Slow and Definite Trembling; And is a Gesture of Slight Refusall: And we see also, that a Dislike causeth (often) that Gesture of the Hand, which we use, when we refuse a Thing, or warne it away. The Frowning and Knitting of the Browes, is a Gathering, or Serring of the *Spirits*, to resist in some Measure. And we see also, this Knitting of the Browes will follow upon earnest Studying, or Cogitation of any Thing, though it be without Dislike.

Shame causeth Blushing; And Casting Downe of the Eyes. Blushing is the Resort of Bloud to the Face; Which in the Passion of Shame, is the Part that laboureth most. And although the Blushing will be seen in the whole Breast, if it be Naked, yet that is but in Passage to the Face. As for the Casting downe of the Eyes, it proceedeth of the Reverence a Man beareth to other Men; Whereby, when he is ashamed, he cannot endure to looke firmly upon Others: And we see, that Blushing, and the Casting downe of the Eyes both, are more when wee come before Many; *Ore Pompeii quid Mollus? Nunquam non coram pluribus erubuit*: And likewise when we come before Great, or Reverend Persons.

Pitie causeth sometimes Teares; And a Flexion or Cast of the Eye aside. Teares come from the same Cause that they doe in Griefe: for Pitie is but Griefe in Anothers Behalfe. The Cast of the Eye is a Gesture of Aversion, or Lothnesse to behold the Object of Pitie.

Wonder causeth Astonishment, or an Immoveable Posture of the Body; Casting up of the Eyes to Heaven; And Lifting up of the Hands. For Astonishment, it is caused by the Fixing of the Minde upon one Object of Cogitation, whereby it doth not spaiate and transcurr, as it useth: For in wonder the *Spirits* flie not, as in Feare; But onely settle, and are made lesse apt to move. As for the Casting up of the Eyes, and Lifting up of the Hands, it is a Kinde of Appeale to the Deity; Which is the Authour, by Power, and Providence, of Strange Wonders.

Laughing causeth a Dilatation of the Mouth, and Lips; A Continued Expulsion of the Breath, with the loud Noise, which maketh the Interjection of Laughing; Shaking of the Breast, and Sides; Running of the Eyes with Water, if it be Violent, and Continued. Wherein first it is to be understood, that Laughing is scarce (properly) a Passion, but hath his Source from the Intellect; For in Laughing there ever precedeth a Conceit of somewhat Ridiculous. And therefore it is Proper to Man. Secondly, that the Cause of Laughing is but a Light Touch of the *Spirits*, and not so deepe an Impression as in other Passions. And therefore, (that which hath no Affinitie with the Passions of the Minde,) it is moved, and that in great vehemency, onely by Tickling some Parts of the Body: And we see that Men even in a Grieved State of Minde, yet cannot sometimes forbear Laughing. Thirdly, it is ever joyned with some Degree of Delight: And therefore Exhilaration hath some Affinitie with Ioy, though it be a much Lighter Motion: *Res severa est verum Gaudium.*

717

718

719

720

721



*dium*. Fourthly, that the Object of it is *Deformitie*, *Absurditie*, *Shrewd Turnes*, and the like. Now to speake of the Causes of the Effects before mentioned, whereunto these *Generall Notes* give some Light. For the *Dilatation* of the *Mouth* and *Lips*, *Continued Expulsion* of the *Breath* and *Voice*, and *Shaking* of the *Breast* and *Sides*, they proceed (all) from the *Dilatation* of the *Spiritus*; Especially being *Sudden*. So likewise, the *Running* of the *Eyes* with *Water*, (as hath beene formerly touched, where wee spake of the *Teares* of *Ioy* and *Griefe*;) is an Effect of *Dilatation* of the *Spiritus*. And for *Suddenesse*, it is a great *Part* of the *Matter*: For we see, that any *Shrewd Turne* that lighteth upon Another; Or any *Deformity*, &c. moveth *Laughter* in the Instant; Which after a little time it doth not. So we cannot *Laugh* at any thing after it is *Stale*, but whilest it is *New*: And even in *Tickling*, if you *Tickle* the *Sides*, and give warning; Or give a *Hard* or *Continued Touch*, it doth not move *Laughter* so much.

722

*Lust* causeth a *Flagrancy* in the *Eyes*; and *Priapisme*. The Cause of both these is, for that in *Lust*, the *Sight*, and the *Touch*, are the Things desired: And therefore the *Spiritus* resort to those parts, which are most affected. And note well in generall, (for that great Use may be made of the *Observation*;) that (evermore) the *Spiritus*, in all *Passions*, resort most to the *Parts*, that labour most, or are most affected. As in the last, which hath been mentioned, they resort to the *Eyes*, and *Venerous Parts*: In *Feare*, and *Anger*, to the *Heart*: In *Shame* to the *Face*: And in *Light Dislikes* to the *Head*.

Experiments  
in Consort,  
touching  
Drunkennesse.

723

It hath been observed by the *Ancients*, and is yet beleaved, that the *Sperme* of *Drunken Men* is *Vasfruitsfull*. The Cause is, for that it is *Over-moistened*, and wanteth *Spirititude*. And wee have a merry Saying, that they that goe *Drunke* to *Bed*, get *Daughters*.

724

*Drunken Men* are taken with a plaine Defect, or *Destitution* in *Voluntary Motion*. They Reele; They tremble; They cannot stand, nor speak strongly. The Cause is, for that the *Spirits* of the *Wine*, oppresse the *Spiritus Animall*, and occupate Part of the Place, where they are; And so make them *Weake* to move. And therefore, *Drunken Men* are apt to fall asleep: And *Opiates*, and *Suupersatives*, (as *Poppy*, *Henbane*, *Hemlocke*, &c.) induce a kinde of *Drunkennesse*, by the *Grossenesse* of their *Vapour*; As *Wine* doth by the *Quantity* of the *Vapour*. Besides, they rob the *Spiritus Animall* of their *Matter*, whereby they are nourished: For the *Spiritus* of the *Wine* prey upon it, as well as they: And so they make the *Spiritus* lesse *Supple*, and *Apt* to move.

725

*Drunken Men* imagine every Thing turneth round; They imagine also that Things come upon them; They See not well Things as farre off; Those Things that they See neare Hand, they See out of their Place; And (sometimes) they see Things double. The Cause of the Imagination that Things turne Round, is, for that the *Spiritus* themselves turne, being compressed by the *Vapour* of the *Wine*: (For any *Liquid Body* upon *Compression*, turneth, as we see in *Water*;) And it is all one to the *Sight*, whether the *Visuall Spirits* move, or the Object moveth, or the *Medium* moveth. And we see that long *Turning Round* breedeth the same Imagination. The Cause of the Imagination that Things come upon them, is, for that the *Spiritus Visuall* themselves draw backe; which maketh the Object seeme to come on; And besides, when they see Things turne Round, and Move, *Feare* maketh them thinke they come upon them. The Cause that they cannot see Things as farre off, is the *Weaknesse* of the *Spiritus*; for in every *Megrim*, or *Vertigo*, there is an *Obtenebration* joyned with a *Semblance* of *Turning Round*; Which we see also in the lighter Sort of *Swounings*.



nings. The Cause of Seeing things out of their Place, is the Refraction of the Spirits Visuall; For the Vapour is as an Vnequall Medium; And it is, as the Sight of Things, out of place, in Water. The Cause of Seeing Things double, is, the Swift and Vnquiet Motion of the Spirits, (being Oppressed,) to and fro; For, (as was said before,) the Motion of the Spirits Visuall, and the Motion of the Object, make the same Appearances; And for the Swift Motion of the Object, wee see, that if you fillip a Lute-String, it sheweth double, or Treble.

Men are sooner Drunke with Small Draughts, than with Great. And againe, Wine Sugred inebriateth lesse, than Wine Pure. The Cause of the Former is, for that the Wine descendeth not so fast to the Bottome or the Stomach; But maketh longer Stay in the Vpper Part of the Stomach, and sendeth Vapours faster to the Head; And therefore inebriateth sooner. And, for the same Reason, Sops in Wine, (Quantity for Quantity,) inebriate more, than Wine of it selfe. The Cause of the Latter is, for that the Sugar doth inspissate the Spirits of the Wine, and maketh them not so easie to resolve into Vapour. Nay further, it is thought, to be some Remedy against Inebriating, if Wine Sugred be taken after Wine Pure. And the same Effect is wrought either by Oyle, or Milke, taken upon much Drinking.

THE Use of Wine, in Drie, and Consumed Bodies, is hurtfull; In Moist, and Full Bodies, it is good. The Cause is, for that the Spirits of the Wine doe prey upon the Dew, or Radicall Moisture, (as they terme it,) of the Body, and so deceive the Animall Spirits. But where there is Moisture Enough, or Superfluous, there Wine helpeth to digest, and desiccate the Moisture.

THE Catterpillar is one of the most Generall of wormes, and breedeth of Dew, & Leaves: For wee see infinite Number of Catterpillers, which breed upon Trees, and Hedges; By which the Leaves of the Trees, or Hedges, are in great Part consumed; As well by their Breeding out of the Lease, as by their Feeding upon the Lease. They breed in the Spring chiefly, because then there is both Dew, and Lease. And they breed commonly when the East Winds have much blowne: The Cause whereof is, the Driness of that Wind: For to all Vivification upon Putrefaction, it is requisite the Matter be not too Moist: And therefore we see, they have Copwebs about them, which is a signe of a Slimy Driness: As wee see upon the Ground, whereupon, by Dew, and Sunne, Copwebs breed all over. Wee see also the Greene Catterpillar breedeth in the Inward Parts of Roses, especially not blowne, where the Dew sticketh: But especially Catterpillers, both the greatest, and the most, breed upon Cabages, which have a Fat Lease, and apt to Putrifie. The Catterpillar towards the End of Summer waxeth Volarile, and turneth to a Butterflie, or perhaps; some other Fly. There is a Catterpillar, that hath a Furre, or Downe upon him, and seemeth to have Affinitie with the Silke-worme.

THE Flies Cantharides are bred of a worme, or Catterpillar, but peculiar to certaine Fruit-Trees; As are the Fig-tree, the Pine-tree, and the wilde Briar; All which beare Sweet Fruit; And Fruit that hath a kinde of secret Biting, or Sharpnesse: For the Fig hath a Milke in it, that is Sweet, and Corrosive: The Pine-Apple hath a Kernell that is Strong and Abstersive: The Fruit of the Briar is said to make Children, or those that Eat them, Scabbed. And therefore, no marvell though Cantharides have such a Corrosive, and Cauterizing Quality; For there is not one other of the Insecta, but is bred of a Duller Manner. The Body of the Cantharides is bright coloured; And it may be,

726

Experiment  
Solitary, touching the  
Help or Hurt  
of wine,  
though Moderately used.

727

Experiment  
Solitary, touching Catterpillers.

728

Experiment  
Solitary, touching the Flies  
Cantharides.

729



be, that the delicate-coloured *Dragon-Flies*, may have likewise some *Corrosive Qualitie*.

Experiments  
in Comfort,  
touching  
*Lasitude*.

730

**L** *Asitude* is remedied by *Bathing*, or *Annointing* with *Oyle*, and *Warmed Water*. The Cause is, for that all *Lasitude* is a kinde of *Contusion*, and *Compression* of the *Parts*; And *Bathing*, and *Annointing* give a *Relaxation*, or *Emollition*: And the *Mixture* of *Oyle*, and *Water*, is better than either of them alone; Because *Water* Entreth better into the *Pores*, and *Oyle* after Entry softneth better. It is found also, that the *Taking* of *Tobacco* doth helpe and discharge *Lasitude*. The Reason whereof is, partly, because by *Chearing* or *Comforting* of the *Spirits*, it openeth the *Parts Compressed*, or *Contused*: And chiefly, because it refresheth the *Spirits* by the *Opiate Vertue* thereof; And so dischargeth *Wearinesse*; as *Sleepe* likewise doth.

731

In *Going up a Hill*, the *Knees* will be most *weary*; In *Going downe a Hill*, the *Thighes*. The Cause is, for that in the *Lift* of the *Feet*, when a *Man* Goeth up the *Hill*, the *Weight* of the *Body* beareth most upon the *Knees*; And in *Going downe the Hill*, upon the *Thighes*.

Experiment  
Solitary, touch-  
ing the  
Casting of the  
Skin, and  
Shell in some  
Creatures.

732

**T**HE *Casting* of the *Skin*, is by the *Ancients* compared, to the *Breaking* of the *Secundine*, or *Call*; but not rightly: For that were to make every *Casting* of the *Skin* a *New Birth*: And besides, the *Secundine* is but a generall *Cover*, not shaped according to the *Parts*; But the *Skin* is shaped according to the *Parts*. The *Creatures*, that cast their *Skin*, are; The *Snake*, the *Viper*, the *Grashopper*, the *Lizard*, the *Silke-worme*, &c. Those that cast their *Shell*, are; The *Lobster*, the *Crab*, the *Crawfish*, the *Hodmandod* or *Dodman*, the *Tortoise*, &c. The *Old Skins* are found, but the *Old Shells* never: So as it is like, they scale off, and crumble away by degrees. And they are knowne, by the *Extream Tendernesse* and *Softnesse* of the *New Shell*; And somewhat by the *Freshnesse* of the *Colour* of it. The Cause of the *Casting* of *Skin*, and *Shell*, should seeme to be the great *Quantitie* of *Matter* in those *Creatures*; that is fit to make *Skin* or *Shell*; And againe, the *Loosnesse* of the *Skin*, or *Shell*, that sticketh not close to the *Flesh*. For it is certaine, that it is the *New Skin*, or *Shell*, that putteth off the *Old*: So we see, that in *Deere*, it is the *Young Horne*, that putteth off the *Old*; And in *Birds*, the *Young Feathers* put off the *Old*: And so *Birds* that have much *Matter* for their *Beake*, cast their *Beakes*; the *New Beake* Putting off the *Old*.

Experiments  
in Comfort,  
touching the  
Postures of the  
Body.

733

**L**ying, not *Erect*, but *Hollow*, which is in the *Making* of the *Bed*; Or with the *Legs gathered up*, which is in the *Posture* of the *Body*, is the more *Wholesome*. The Reason is, the better *Comforting* of the *Stomach*, which is by that lesse *Penfile*: And we see, that in *Weake Stomachs*, the *Laying up* of the *Legs* high, and the *Knees* almost to the *Mouth*, helpeth, and comforteth. We see also that *Gally-Slaves*, notwithstanding their *Miserie* otherwise, are commonly *Fat* and *Fleshy*; And the Reason is, because the *Stomach* is supported somewhat in *Sitting*; And is *Penfile* in *Standing*, or *Going*. And therefore, for *Prolongation* of *Life*, it is good to choose those *Exercises*, where the *Limbs* move more than the *Stomach*, and *Belly*; As in *Rowing*, and in *Sawing*, being *Set*.

734

*Megrims* and *Giddinesse* are rather when we *Rise*, after long *Sitting*, than while we *Sit*. The Cause is, for that the *Vapours*, which were gathered by *Sitting*, by the *Sudden Motion*, flie more up into the *Head*.

735

*Leaning long* upon any *Part* maketh it *Numme*, and, as we call it, *Asleepe*.

The



The Cause is, for that the Compression of the Part suffereth not the Spirits to have free Access; And therefore when we come out of it, wee feele a Stinging, or Pricking; Which is the Re-entrance of the Spirits.

**I**Thath beene noted, that those Yeares are Pestilentiall, and Vnwholesome, when there are great Numbers of Frogs, Flies, Locusts, &c. The Cause is plaine; For that those Creatures being engendred of Putrefaction, when they abound, shew a generall Disposition of the Yeare, and Constitution of the Aire, to Diseases of Putrefaction. And the same Prognosticke, (as hath beene said before,) holdeth, if you find wormes in Oake-Apples. For the Constitution of the Aire, appeareth more subtilly, in any of these Things, than to the Sense of Man.

Experiment  
Solitary, touching  
Pestilentiall Yeares.

736

**I**T is an Observation amongst Countrey People, that Yeares of Store of Hawes and Heps, doe commonly portend Cold Winters; And they ascribe it to Gods Providence, that, (as the Scripture saith) reacheth even to the Falling of a Sparrow; And much more is like to reach to the Preservation of Birds in such Seasons. The Naturall Cause also may be the Want of Heat, and Abundance of Moisture, in the Summer precedent; Which putteth forth those Fruits, and must needs leave great Quantity of Cold Vapours, not dissipate; Which causeth the Cold of the Winter following.

Experiment  
Solitary, touching the  
Prognosticks of  
Hard Winters.

737

**T**hey have in Turkey, a Drinke called Coffa, made of a Berry of the same Name, as Blacke as Soot, and of a Strong Sem, but not Aromaticall; Which they take, beaten into Powder, in Water, as Hot as they can drinke it: And they take it, and sit at it in their Coffa-Houses, which are like our Tavernes. This Drinke comforteth the Braine, and Heart, and helpeth Digestion. Certainly this Berry-Coffa; The Root, and Lease Betell; The Lease Tobacco; And the Teare of Poppy, (Opium,) of which the Turkes are great Takers, (supposing it expelleth all Feare;) doe all Condense the Spirits, and make them Strong, and Aleger. But it seemeth they are taken after severall manners; For Coffa and Opium are taken downe; Tobacco but in Smoake; And Betell is but champed in the Mouth, with a little Lime. It is like there are more of them, if they were well found out, and well corrected. Quere of Henbane-Seed; Of Mandrake; Of Saffron, Root, and Flower; Of Folium Indum; Of Amber-grice; of the Assyrian Amomum, if it may bee had; And of the Scarlet Powder, which they call Kermex; And (generally) of all such Things, as doe inebriate and provoke Sleepe. Notethat Tobacco is not taken in Root, or Seed, which are more forcible ever than Leaves.

Experiment  
Solitary, touching  
Medicines that  
Condense, and  
Relieve the  
Spirits.

738

**T**He Turkes have a Blacke Powder, made of a Minerall called Alcohole; Which with a fine long Pencill they lay under their Eye-Lids; Which doth colour them Blacke; Whereby the white of the Eye is set off more white. With the same Powder they colour also the Haires of their Eye lids, and of their Eye-browes, which they draw into Embowed Arches. You shall finde that Xenophon maketh Mention, that the Medes used to paint their Eyes. The Turkes use with the same Tincture, to colour the Haire of their Heads and Beards Blacke: And divers with us, that are growne Gray, and yet would appeare Young, finde meanes to make their Haire black, by Combing it, (as they say,) with a Leaden Combe, or the like. As for the Chineses, who are of an ill Complexion, (being Olivaster,) they paint their Cheekes Scarlet; Especially their King, and Grandes. Generally, Barbarous People, that goe Naked,

Experiment  
Solitary, touching  
Pain-  
tings of the  
Body.

739



Naked, doe not onely paint Themselves, but they pounce and raze their Skinne, that the *Painting* may not be taken forth; And make it into Works. So doe the *West Indians*; And so did the Ancient *Picts*, and *Brittons*; So that it seemeth, *Mena* would have the *Colours* of *Birds Feathers*, if they could tell how; Or at least, they will have *Gay Skins*, in stead of *Gay Cloathes*.

Experiment  
Solitary, touch-  
ing the Use  
of *Bathing* and  
*Annointing*.

740

IT is strange, that the use of *Bathing*, as a Part of *Diet*, is left. With the *Romans*, and the *Grecians*, it was as usuall, as *Eating*, or *Sleeping*: And so is it amongst the *Turkes* at this day: Whereas with us it remaineth but as a Part of *Physicke*. I am of Opinion, that the Use of it, as it was with the *Romans*, was hurtfull to Health; For that it made the Body Soft, and easie to Waste. For the *Turkes* it is more proper, because of their *Drinking Water*, and *Feeding* upon *Rize*, and other Food of small Nourishment, maketh their Bodies so Solide, and Hard, as you need not feare that *Bathing* should make them *Froathy*. Besides, the *Turkes* are great *Sitters*, and seldome walke; Whereby they Sweat lesse, and need *Bathing* more. But yet certain it is, that *Bathing*, and especially *Annointing*, may be so used, as it may be a great Help to Health, and *Prolongation* of Life. But hereof we shall speake in due Place, when we come to handle *Experiments Medicinall*.

Experiment  
Solitary touch-  
ing *Chamo-*  
*letting* of  
*Paper*.

741

THE *Turks* have a Pretty Art of *Chamoletting* of *Paper*, which is not with us in use. They take divers Oyled Colours, and put them severally (in drops) upon *Water*; And stirre the *Water* lightly; And then wet their *Paper*, (being of some Thicknesse,) with it; And the *Paper* will bee Waved, and Veined, like *Chamolet*, or *Marble*.

Experiment  
Solitary, touch-  
ing *Cuttle-*  
*Inke*.

742

IT is somewhat strange, that the *Bloud* of all *Birds*, and *Beasts*, and *Fishes*, should be of a Red Colour, and onely the *Bloud* of the *Cuttle* should bee as Blacke as *Inke*. A Man would thinke, that the Cause should be the *High Concoction* of that *Bloud*; For we see in ordinary *Puddings*, that the *Boyling* turneth the *Bloud* to be Blacke; And the *Cuttle* is accounted a delicate *Meat*, and is much in Request.

Experiment  
Solitary, touch-  
ing *Encrease*  
of weight in  
*Earth*.

743

IT is reported of Credit, that if you take *Earth*, from Land adjoyning to the *River* of *Nile*; And preserve it in that manner, that it neither come to be Wet, nor Wasted; And Weigh it daily, it will not alter Weight untill the seventeenth of *Iune*, which is the Day when the *River* beginneth to rise; And then it will grow more and more *Ponderous* till the *River* commeth to his Heighth. Which if it be true, it cannot bee caused, but by the *Aire*, which then beginneth to Condense; And so turneth within that Small *Mould* into a degree of *Moisture*; Which produceth weight. So it hath beene observed, that *Tobacco*, Cut, and Weighed, and then Dried by the Fire, loseth Weight; and after being laid in the open *Aire*, recovereth weight againe. And it should seeme, that as soone as ever the *River* beginneth to increase, the whole *Bodie* of the *Aire* thereabouts suffereth a Change: For (that which is more strange,) it is credibly affirmed, that upon that very Day, when the *River* first riseth, great *Plagues*, in *Cairo*, use suddenly to breake up.

Experiments  
in Consort,  
touching  
*Sleep*.

744

THose that are very Cold, and especially in their Feet, cannot get to *Sleepe*. the Cause may be, for that in *Sleepe* is required a *Free Respiration*, which Cold doth shut in, and hinder: For we see, that in great Colds, one can scarce draw



draw his *Breath*. Another *Cause* may be, for that *Cold* calleth the *Spirits* to succour; And therefore they cannot so well close, and goe together in the *Head*; which is ever requisite to *Sleepe*. And for the same *Cause*, *Paine*; and *Noise* hinder *Sleepe*; And *Darknesse* (contrariwise) furthereth *Sleepe*.

Some *Noises* (whereof wee spake in the 112. *Experiment*) help *Sleep*; As the *Blowing* of the *Wind*, the *Trickling* of *Water*, *Humming* of *Bees*, *Soft Singing*, *Reading*, &c. The *Cause* is, for that they move in the *Spirits* a gentle *Attention*; And whatsoever moveth *Attention*, without too much *Labour*, stilleth the *Naturall* and *discursive Motion* of the *Spirits*.

*Sleepe* nourisheth, or at least preserveth *Bodies*, a long time, without other *Nourishment*. *Beasts* that sleep in *Winter*, (as it is noted of *Wilde Beares*;) during their *Sleepe* wax very *Fat*, though they *Eat* nothing. *Bats* have bin found in *Ovens*, and other *Hollow Close Places*, Matted one upon another; And therefore it is likely that they *Sleepe* in the *Winter* time, and eat *Nothing*. *Quare*, whether *Bees* do not *Sleep* all *Winter*, and spare their *Honey*? *Butterflies*, and other *Flies*, do not onely *Sleep*, but lie as *Dead* all *Winter*; And yet with a little *Heat* of *Sunne*, or *Fire*, revive againe. A *Dormouse*, both *Winter* and *Summer*, will *Sleep* some dayes together, and eat *Nothing*.

To restore *Teeth* in *Age*, were *Magnale Naturæ*. It may bee thought of. But howsoever, the *Nature* of the *Teeth* deserveth to be inquired of, as well as the other *Parts* of *Living Creatures Bodies*.

There be Five *Parts* in the *Bodies* of *Living-Creatures*, that are of *Hard Substance*; The *Skull*; The *Teeth*; The *Bones*; The *Hornes*; and the *Nails*. The greatest *Quantity* of *Hard Substance* Continued, is towards the *Head*. For there is the *Skull* of one Entire *Bone*; There are the *Teeth*; There are the *Maxillary Bones*; There is the *Hard Bone*, that is the *Instrument* of *Hearing*; And thence issue the *Hornes*: So that the *Building* of *Living Creatures Bodies*, is like the *Building* of a *Timber-House*, where the *Walls*, and other *Parts* have *Columnes*, and *Beames*; But the *Roofe* is, in the *Better Sort* of *Houses*, all *Tile*, or *Lead*, or *Stone*. As for *Birds*, they have Three other *Hard Substances* proper to them; The *Bill*, which is of like *Matter* with the *Teeth*; For no *Birds* have *Teeth*: The *Shell* of the *Egge*: And their *Quills*: For as for their *Spurre*, it is but a *Nail*. But no *Living-Creatures*, that have *Shells* very hard; (As *Oysters*, *Cocles*, *Mussels*, *Scallops*, *Crabs*, *Lobsters*, *Cra-fish*, *Shrimps*, and especially the *Tortoise*;) have *Bones* within them, but onely little *Gristles*.

*Bones*, after full *Growth*, continue at a *Stay*: And so doth the *Skull*: *Hornes*, in some *Creatures*, are cast, and renewed: *Teeth* stand at a *Stay*, except their *Wearing*: As for *Nails*, they grow continually: And *Bills* and *Beakes* will over-grow, and sometimes be cast; As in *Eagles*, and *Parrots*.

Most of the *Hard Substances* flie to the *Extremes* of the *Body*; As *Skull*, *Hornes*, *Teeth*, *Nails*, and *Beakes*: Onely the *Bones* are more *Inward*, and clad with *Flesh*. As for the *Entrailes*, they are all without *Bones*; Save that a *Bone* is (sometimes) found in the *Heart* of a *Stag*; And it may bee in some other *Creature*.

The *Skull* hath *Braines*; as a kinde of *Marrow*, within it. The *Backe-Bone* hath one Kinde of *Marrow*, which hath an *Affinitie* with the *Braine*; And other *Bones* of the *Body* have another. The *Jaw-Bones* have no *Marrow* Severed, but a little *Pulp* of *Marrow* diffused. *Teeth* likewise are thought to

745

746

Experiments  
in Consort,  
touching  
Teeth and  
Hard Substan-  
ces in the Bo-  
dies of Living  
Creatures.

747

748

749

750



have a kinde of *Marrow* diffused, which causeth the *Sense*, and *Paine*: But it is rather *Sinnew*; For *Marrow* hath no *Sense*; No more than *Bloud*. *Horne* is alike throughout; And so is the *Naile*.

None other of the *Hard Substances* have *Sense*, but the *Teeth*: And the *Teeth* have *Sense*, not onely of *Paine*, but of *Cold*.

But we will leave the Enquiries of other *Hard Substances*, unto their severall *Places*; And now enquire onely of the *Teeth*.

The *Teeth* are, in *Men*, of three *Kindes*: *Sharp*, as the *Fore-Teeth*; *Broad*, as the *Back-Teeth*, which we call the *Molar-Teeth*, or *Grinders*; And *Pointed-Teeth*, or *Canine*, which are betweene both. But there have beene some *Men*, that have had their *Teeth* undivided, as of one whole *Bone*, with some little *Marke* in the *Place* of the *Division*; As *Pyrrhus* had. Some *Creatures* have *Over-long*, or *Out-growing Teeth*, which we call *Fangs*, or *Tuskes*; As *Boares*, *Pikes*, *Salmons*, and *Dogs*, though lesse. Some *Living Creatures* have *Teeth* against *Teeth*; As *Men*, and *Horses*; And some have *Teeth*, especially their *Master-Teeth*, indented one within another, like *Games*; As *Lions*; And so againe have *Dogs*. Some *Fishes* have divers *Rowes* of *Teeth* in the *Roofes* of of their *Mouthes*; As *Pikes*, *Salmonds*, *Trouts*, &c. And many more in *Salt-waters*. *Snakes*, and other *Serpents* have *Venomous Teeth*; Which are sometimes mistaken for their *Sting*.

No *Beast* that hath *Hornes*, hath *Vpper Teeth*; And no *Beast*, that hath *Teeth* above, wanteth them below: But yet if they be of the same kinde, it followeth not, that if the *Hard Matter* goeth not into *Vpper Teeth*, it will goe into *Hornes*; Nor yet *converso*; For *Doe's*, that have no *Hornes*, have no *Vpper Teeth*.

*Horses* have, at three yeares old, a *Tooth* put forth, which they call the *Colts Tooth*; And at foure yeares old there commeth the *Mark-Tooth*, which hath a *Hole*, as big as you may lay a *Pease* within it; And that weareth shorter and shorter, every yeare, Till that at eight yeares old, the *Tooth* is smooth, and the *Hole* gone; And then they say; That the *Marke* is out of the *Horses Mouth*.

The *Teeth* of *Men* breed first, when the *Childe* is about a yeare and halfe old: And then they cast them, and new come about seven yeares old. But divers have *Backward-Teeth* come forth at *Twenty*, yea some at *Thirty*, and *Forty*. *Quere* of the manner of the *Comming* of them forth. They tell a *Tale* of the old *Countesse* of *Desmond*, who lived till she was *sevenscore*-yeares old, that she did *Dentire* twice, or thrice; Casting her old *Teeth*, and others *Comming* in their *Place*.

*Teeth* are much hurt by *Sweet-Meats*; And by *Painting* with *Mercury*; And by *Things Over-hot*; And by *Things Over-cold*; And by *Rheumes*. And the *Paine* of the *Teeth*, is one of the sharpest of *Paines*.

Concerning *Teeth*, these *Things* are to bee Considered. 1. The *Preserving* of them. 2. The *Keeping* of them *White*. 3. The *Drawing* of them with *Least Paine*. 4. The *Staying* and *Easing* of the *Tooth-ach*. 5. The *Binding* in of *Artificiall Teeth*, where *Teeth* have beene stricken out. 6. And last of all, that *Great One*, of *Restoring Teeth* in *Age*. The *Instances* that give any *likeli-hood* of *Restoring Teeth* in *Age*, are, The *Late Comming* of *Teeth* in some; And the *Renewing* of the *Beakes* in *Birds*, which are *Commateriall* with *Teeth*. *Quere* therefore more particularly how that commeth. And againe, the *Renewing* of *Hornes*. But yet that hath not beene knowne to have beene provoked by *Art*; Therefore let *Triall* be made, whether *Hornes* may be procured to grow in *Beasts* that are not *Horned*, and how? And whether they



they may be procured to come *Larger* than usuall; As to make an *Oxe*, or a *Deere*, have a *Greater Head* of *Hornes*? And whether the *Head* of a *Deere*, that by *Age* is more *Spitted*, may bee brought againe to be more *Branched*; For these *Trialls*, and the like, will shew, whether by *Art* such *Hard Matter* can be called, and provoked. It may bee tried also, whether *Birds* may not have something done to them when they are *Young*, whereby they may bee made to have *Greater*, or *Longer Bills*; Or *Greater*, and *Longer Talons*? And whether *Children* may not have some *wash*, or Some thing to make their *Teeth Better*, and *Stronger*? *Corall* is in use as an *Help* to the *Teeth* of *Children*.

**S**ome *Living Creatures* *Generate* but at certaine *Seasons* of the *Yeare*; As *Deere*, *Sheep*, *Wilde Coneyes*, &c. And most *Sorts* of *Birds*, and *Fishes*: Others at any time of the *Yeare*, as *Men*; And all *Domestick Creatures*; As *Horses*, *Hogs*, *Dogs*, *Cats*, &c. The *Cause* of *Generation* at all *Seasons* seemeth to be *Fulnesse*: For *Generation* is from *Redundance*. This *Fulnesse*, ariseth from two *Causes*; Either from the *Nature* of the *Creature*, if it be *Hot*, and *Moist*, and *Sanguine*; Or from *Plenty* of *Food*. For the first, *Men*, *Horses*, *Dogs*, &c. which breed at all *Seasons*, are full of *Heat*, and *Moisture*; *Doves* are the fullest of *Heat* and *Moisture* amongst *Birds*, and therefore breed often; The *Tame Dove* almost continually. But *Deere* are a *Melancholy Drie Creature*, as appeareth by their *Fearfulnesse*, and the *Hardnesse* of their *Flesh*. *Sheepe* are a *Cold Creature*, as appeareth by their *Mildenesse*, and for that they seldome *Drinke*. Most sort of *Birds* are of a *drie Substance* in comparison of *Beasts*. *Fishes* are cold. For the second *Cause*, *Fulnesse* Of *Food*; *Men*, *Kine*, *Swine*, *Dogs*, &c. feed full; And we see that those *Creatures*, which being *wilde*, generate seldome, being *Tame*, generate often; Which is from *Warmth*, and *Fulnesse* of *Food*. We finde, that the *Time* of *Going* to *Rut* of *Deere* is in *September*; For that they need the whole *Summers Feed* and *Grasse*, to make them fit for *Generation*. And if *Raine* come *Earely* about the *Middle* of *September*, they goe to *Rut* somewhat the sooner; If *Drought*, somewhat the later. So *Sheep*, in respect of their small *Heat*, generate about the same time, or somewhat before. But for the most part, *Creatures* that generate at certaine *Seasons*, generate in the *Spring*; As *Birds*, and *Fishes*; For that the *End* of the *Winter*, and the *Heat* and *Comfort* of the *Spring* prepareth them. There is also another *Reason*, why some *Creatures* generate at certaine *Seasons*: And that is the *Relation* of their *Time* of *Bearing*, to the time of *Generation*: For no *Creature* goeth to generate, whilest the *Female* is full; Nor whilest she is busie in *Sitting*, or *Rearing* her *Young*. And therefore it is found by *Experience*, that if you take the *Egges*, or *Young Ones*, out of the *Nests* of *Birds*, they will fall to generate againe, three or foure times, one after another.

Of *Living Creatures*, some are longer time in the *womb*, and some shorter. *Women* goe commonly nine *Moneths*; The *Cow* and the *Ewe* about sixe *Moneths*; *Doe's* goe about nine *Moneths*; *Mares* eleven *Moneths*; *Bitches* nine *Weekes*; *Elephants* are said to goe two *Yeares*; For the Received *Tradition* of ten *Yeares* is *Fabulous*. For *Birds* there is double *Enquiry*; The *Distance* betweene the *Treading* or *Coupling*, and the *Laying* of the *Egge*; And againe, between the *Egge Layed*, and the *Discloding* or *Hatching*. And amongst *Birds* there is lesse *Diversitie* of *Time*, than amongst other *Creatures*; yet some there is: For the *Hen* sitteth but three *Weekes*; The *Turkey-Hen*, *Goose*, and *Ducke*, a *Moneth*: *Quere* of others. The *Cause* is of the great *Difference* of *Times*, amongst *Living Creatures*, is, Either from the *Nature* of the *Kinde*;

Experiments  
in Confort,  
touching the  
Generation  
and Bearing of  
Living Crea-  
tures in the  
wombe.

758

759



Or from the *Constitution* of the *Womb*. For the former, those that are longer in *Comming* to their *Maturity* or *Growth*, are longer in the *Womb*; As is chiefly seene in *Men*; And so *Elephants* which are long in the *Womb*, are long time in *Comming* to their full *Growth*. But in most other *Kindes*, the *Constitution* of the *Womb*, (that is, the *Hardnesse*, or *Driness* thereof,) is concurrent with the former *Cause*. For the *Colt* hath about foure yeares of *Growth*; And so the *Fawne*; And so the *Calse*. But *Whelps*, which come to their *Growth* (commonly) within three *Quarters* of a yeare, are but nine *Weekes* in the *Womb*. As for *Birds*, as there is lesse *Diversitie*, amongst them in the time of their *Bringing forth*; So there is lesse *Diversitie* in the time of their *Growth*; Most of them *comming* to their *Growth* within a *Twelve-Moneth*.

Some *Creatures* bring forth many *Young Ones* at a *Birth*; As *Bitches*, *Hares*, *Conneyes*, &c. Some (ordinarily) but *One*; As *Women*, *Lionesses*, &c. This may be caused, either by the *Quantity* of *Sperme* required to the *Producing* One of that *Kinde*; which if lesse be required, may admit greater *Number*; If more, fewer: Or by the *Partitions* and *Cells* of the *Womb*, which may sever the *Sperme*.

Experiments  
in Consort  
touching  
Species Visible.

761

There is no doubt, but *Light* by *Refraction* will shew greater, as well as *Things Coloured*. For like as a *Shilling*, in the *Bottom* of the *Water*, will shew greater; So will a *Candle* in a *Lanborne*, in the *Bottom* of the *Water*. I have heard of a *Practice*, that *Glo-wormes* in *Glasses* were put in the *Water*, to make the *Fish* come. But I am not yet informed, whether when a *Diver* *Diveth*, having his *Eyes* open, and swimmeth upon his *Back*, whether (I say) he seeth *Things* in the *Aire*, greater, or lesse. For it is manifest, that when the *Eye* standeth in the *Finer Medium*, and the *Object* is in the *Grosser*, things shew greater; But contrariwise, when the *Eye* is placed in the *Grosser Medium*, and the *Object* in the *Finer*, how it worketh I know not.

762

It would be well boulded out, whether great *Refractions* may not be made upon *Reflexions*, as well as upon *Direct Beames*. For Example, Wee see, that take an *Empy Bason*, put an *Angell* of *Gold*, or what you will, into it; Then goe so farre from the *Bason*, till you cannot see the *Angell*, because it is not in a *Right Line*; Then fill the *Bason* with *Water*, and you shall see it out of his *Place*, because of the *Reflexion*. To proceed therefore, put a *Looking-Glasse* into a *Bason* of *Water*; I suppose you shall not see the *Image* in a *Right Line*, or at equall *Angles*, but aside. I know not whether this *Experiment* may not be extended so, as you might see the *Image*, and not the *Glasse*; Which for *Beautie*, and *Strangenesse*, were a fine *Prooffe*: For then you should see the *Image* like a *Spirit* in the *Aire*. As for Example, If there be a *Cisterne* or *Poole* of *Water*, you shall place over against it a *Picture* of the *Devill*, or what you will, so as you doe not see the *Water*. Then put a *Looking-Glasse* in the *Water*: Now if you can see the *Devills Picture* aside, not seeing the *Water*, it will looke like a *Devill* indeed. They have an old tale in *Oxford*, that *Friar Bacon* walked betweene two *Steeple*s: Which was thought to be done by *Glasses*, when he walked upon the *Ground*.

Experiments  
in Consort,  
touching  
Impulsion, and  
Percussion.

763

A *weighy Body* put into *Motion*, is more easily impelled, than at first when it *Resteth*. The *Cause* is, partly because *Motion* doth discusse the *Tor-pour* of *Solide Bodies*; Which beside their *Motion* of *Gravity*, have in them a *Naturall Appetite*, not to move at all; And partly, because a *Body* that *resteth*, doth get, by the *Resistance* of the *Body* upon which it *resteth*, a stronger *Compression*



*Compression of Parts*, than it hath of it Selfe: And therefore needeth more Force to be put in *Motion*. For if a *Weighty Body* be Penfile, and hang but by a *Thred* the *Percussion* will make an *Impulsion* very neare as easily, as if it were already in *Motion*.

A *Body Over-great*, or *Over-small*, will not be throwne so farre, as a *Body* of a *Middle Size*: So that (it seemeth) there must be a *Commensuration*, or *Proportion*, betweene the *Body Moved*, and the *Force*, to make it move well. The *Cause* is, because to the *Impulsion*, there is requisite the *Force* of the *Body* that *Moveth*, and the *Resistance* of the *Body* that is *Moved*: And if the *Body* be too great, it yeeldeth too little; And if it be too small, it resisteth too little.

It is *Common Experience*, that no *Weight* will presse or cut so strong, being laid upon a *Body*, as *Falling*, or *strucken* from above. It may bee the *Aire* hath some part in furthering the *Percussion*: But the chiefe *Cause* I take to be, for that the *Parts* of the *Body Moved*, have by *Impulsion*, or by the *Motion* of *Gravitie continued*, a *Compression* in them, as well downwards, as they have when they are throwne, or *Shot* thorow the *Aire* forwards. I conceive also, that the quicke *Loose* of that *Motion*, preventeth the *Resistance* of the *Body* below; And *Priority* of the *Force*, (always,) is of great *Efficacie*; As appeareth in infinite *Instances*.

**T**ickling is most in the *Soles* of the *Feet*, and under the *Arme-Holes*, and on the *Sides*. The *Cause* is, the *Thinness* of the *Skin* in those *Parts*; Joy-  
ned with the *Rareness* of being touched there. For all *Tickling* is a light *Motion* of the *Spiritus*, which the *Thinness* of the *Skin*, and *Suddenness*, and *Rareness* of *Touch*, doe further: For we see, a *Feather*, or a *Rush*, drawne along the *Lip*, or *Cheeke*, doth tickle; Whereas a *Thing* more *Obiuse*, or a *Touch* more *Hard*, doth not. And for *Suddenness*; Wee see no *Man* can tickle himselfe: We see also that the *Palme* of the *Hand*, though it hath as *Thin* a *Skin*, as the other *Parts* Mentioned, yet is not *Ticklish*, because it is accustomed to be *Touched*. *Tickling* also causeth *Laughier*. The *Cause* may bee, the *Emission* of the *Spiritus*, and so of the *Breath*, by a *Flight* from *Titillation*; For upon *Tickling*, we see there is ever a *Starting*, or *Sbrinking* away of the *Part*, to avoid it; And we see also, that if you *Tickle* the *Nostrils* with a *Feather*, or *Straw*, it procureth *Sneezing*; Which is a *Sudden Emission* of the *Spiritus*, that doe likewise expell the *Moisture*. And *Tickling* is ever *Painfull*, and not well endured.

**I**t is strange, that the *River* of *Nilus*, *Over-flowing*, as it doth, the *Countray* of *Egypt*, there should be neverthelesse little or no *Raine* in that *Countray*. The *Cause* must be, Either in the *Nature* of the *Water*; Or in the *Nature* of the *Aire*; Or of Both. In the *Water*, it may bee ascribed, either unto the *Long Race* of the *Water*: For *Swift Running Waters* vapour not so much as *Standing Waters*; Or else to the *Concoction* of the *Water*; For *Waters* well *Concocted* vapour not so much, as *Waters Raw*; No more than *Waters* upon the *Fire* doe vapour so much, after some time of *Boyling*, as at the first. And it is true, that the *Water* of *Nilus* is sweeter than other *Waters* in *Taste*; And it is excellent Good for the *Stone*, and *Hypochondriacall Melancholy*; Which sheweth it is *Lenifying*: And it runneth thorow a *Countray* of a *Hot Climate*, and flat, without *Shade*, either of *woods*, or *Hills*; Whereby the *Sunne* must needs have great Power to *Concoct* it. As for the *Aire*, (from whence I conceive this want of *Showers* commeth chiefly;) The *Cause*

764

765

Experiment  
Solitary, touch-  
ing, Titilla-  
tion.

766

Experiment  
Solitary, touch-  
ing the  
Scarcitie of  
Raine in  
Egypt.

767



must be, for that the *Aire* is, of it selfe, *Thin* and *Thirsty*; And as soone as ever it getteth any *Moisture* from the *Water*, it imbibeth, and dissipateth it, in the whole body of the *Aire*; And suffereth it not to remaine in *Vapour*; Whereby it might breed *Raine*.

Experiment  
Solitary, touch-  
ing Clarifi-  
cation.

768

**I**T hath beene touched in the *Title of Percolations*, (Namely such as are *Inwards*;) that the *Whites of Egges*, and *Milke*, doe clarify, And it is certain, that in *Egypt*, they prepare and clarify the *Water of Nile*, by putting it into great *Jarres of Stone*, and Stirring it about with a few Stamped *Almonds*; Wherewith they also besmeare the Mouth of the *Vessell*; And so draw it off, after it hath rested some time. It were good, to trie this *Clarifying* with *Almonds*, in *New Beere*, or *Must*, to hasten, and perfect the *Clarifying*.

Experiment  
Solitary, touch-  
ing Plants  
without  
Leaves.

769

**T**HERE be scarce to be found any *Vegetables*, that have *Branches*, and no *Leaves*; except you allow *Corall* for one. But there is also in the *Desarts* of *S. Macario* in *Egypt*, a *Plant* which is Long, *Leavelesse*, Browne of Colour, and Branched like *Corall*, save that it closeth at the *Top*. This being set in *Water* within *House*, spreadeth and displayeth strangely; And the People thereabouts have a *Superstitious Beleeve*, that in the *Labour of Women*, it helpeth to the *Easie Deliverance*.

Experiment  
Solitary, touch-  
ing the  
Materials of  
Glasse.

770

**T**HE *Chrystalline Venice Glasse*, is reported to be a Mixture, in equall Portions, of *Stones*, brought from *Pavia*, by the *River Ticinum*; And the *Ashes* of a *Weed*, called by the *Arabs Kall*, which is gathered in a *Desart* betweene *Alexandria*, and *Rosetta*; And is by the *Egyptians* used first for *Fuell*; And then they crush the *Ashes* into Lumps, like a *Stone*; And so sell them to the *Venetians* for their *Glasse-works*.

Experiment  
Solitary, touch-  
ing Prohibi-  
tion of Putre-  
faction, and  
the Long  
Conservation  
of Bodies.

771

**I**T is strange, and well to be noted, how long *Carkasses* have continued *Uncorrupt*, and in their former *Dimensions*; As appeareth in the *Mummies* of *Egypt*; Having lasted, as is conceived, (some of them,) three thousand yeares. It is true, they finde Meanes to draw forth the *Braines*, and to take forth the *Enirailles*, which are the *Parts* aptest to corrupt. But that is nothing to the Wonder: For we see, what a Soft and corruptible Substance the *Flesh*, of all the other *Parts* of the *Body*, is. But it should seeme, that according to our *Observation*, and *Axiome*, in our hundredth Experiment, *Putrefaction*, which wee conceive to bee so *Naturall a Period* of *Bodies*, is but an *Accident*; And that *Matter* maketh not that *Haste to Corruption*, that is conceived. And therefore *Bodies*, in *Shining-Amber*; In *Quick-Silver*; In *Balmes*, (whereof we now speake;) In *Wax*; In *Honey*; In *Gummes*; And (it may be) in *Conservatories of Snow*; &c. are preserved very long. It need not goe for Repetition, if wee resume againe that which wee said in the afore-said Experiment, concerning *Annihilation*; Namely, that if you provide against three Causes of *Putrefaction*, *Bodies* will not corrupt: The First is, that the *Ayre* be *Excluded*; For that undermineth the *Body*, and conspireth with the *Spirit* of the *Bodie* to dissolve it. The Second is, that the *Body* *Adjacent* and *Ambient*, be not *Commateriall*, but meerely *Heterogeneall* towards the *Body* that is to be preserved: For if nothing can bee received by the One, Nothing can issue from the Other, Such are *Quick-Silver*, and *Whine-Amber*, to *Herbs*, and *Flies*, and such *Bodies*. The Third is, that the *Body* to be preserved, be not of that *Grosse*, that it may corrupt within it selfe, although no Part of it issue into the *Body* *Adjacent*: And therefore it must be rather *Thin*, and



and Small, than of Bulke. There is a Fourth Remedie also, which is; That if the Body to be preserved be of Bulke, as a Corps is, then the Body that incloseth it, must have a Vertue to draw forth, and drie the Moisture of the Inward Body; For else the Putrefaction will play within, though Nothing issue forth. I remember Livy doth relate, that there were found, at a time, two Coffins of Lead, in a Tombe; Whereof the one contained the Body of King Numa; It being some foure hundred yeares after his Death: And the other, his Bookes Of Sacred Rites and Ceremonies, and the Discipline of the Pontifes; And that in the Coffin that had the Body, there was Nothing (at all) to bee seene, but a little light Cinders about the Sides; But in the Coffin that had the Books, they were found as fresh, as if they had been but newly Written; being written in Parchment, and covered over with Watch-Candles of Wax; three or four fold. By this it seemeth, that the Romans, in Numa's time, were not so good Embalmers, as the Egyptians were; Which was the Cause that the Body was utterly consumed. But I finde in Plutarch, and Others, that when Augustus Caesar visited the Sepulchre of Alexander the Great, in Alexandria, he found the Body to keep his Dimension; But withall, that, notwithstanding all the Embalming, (which no doubt was of the best,) the Body was so Tender, as Caesar touching but the Nose of it, defaced it. Which maketh me finde it very strange, that the Egyptian Mummies should be reported to be as hard as Stone-Pitch: For I finde no difference but one; Which indeed may be very Materiall; Namely, that the Ancient Egyptian Mummies, were throwed in a Number of Folds of Linnen, besmeared with Gums, in manner of Seare-Cloth; Which it doth not appeare was practised upon the Body of Alexander.

**N**EARE the Castle of Carie, and by the Wells of Assan, in the Land of Idumea, a great Part of the Way, you would thinke the Sea were neare hand, though it be a good distance off: And it is Nothing, but the Shining of the Nitre, upon the Sea-Sands; Such Abundance of Nitre the Shores there doe put forth.

**T**HE Dead-Sea, which vomiteth up Bitumen, is of that Crasitude, as Living Bodies bound Hand and Foot, cast into it, have been borne up, and not sunke. Which sheweth, that all Sinking into Water, is but an Overweight of the Bodie, put into the Water, in respect of the Water: So that you may make Water so strong, and heavy, of Quick-Silver, (perhaps,) or the like, as may beare up Iron: Of which I see no Use, but Imposture. We see also, that all Metalls, except Gold, for the same reason swimme upon Quicke-Silver.

**I**T is reported, that at the Foot of a Hill, neare the Mare mortuum, there is a Blacke-Stone (whereof Pilgrims make Fires,) which burneth like a Coale, and diminisheth not; But onely waxeth Brighter, and Whiter. That it should doe so, is not strange; For we see Iron Red Hot burneth, and consumeth not: But the Strangenesse is, that it should continue any time so: For Iron, as soone as it is out of the Fire, deadeth straight-ways. Certainly, it were a Thing of great Use, and Profit, if you could finde out Fuell, that would burne Hot, and yet last long: neither am I altogether Incredulous, but there may be such Candles, as they say are made of Salamanders wooll, Being a Kind of Minerall, which whiteneth also in the Burning, and consumeth not. The Question is this; Flame must be made of somewhat; And commonly it

Experiment  
Solitary, touching the  
Abundance of  
Nitre in  
certain Sea-  
Shoares.

772

Experiment  
Solitary, touching Bodies  
that are borne  
up by Water.

773

Experiment  
Solitary, touching Fuell,  
that consumeth little, or  
nothing.

774

is



is made of some *Tangible Body*, which hath *Weight*: But it is not impossible, perhaps, that it should be made of *Spirit*, or *Vapour*, in a *Body*; (which *Spirit* or *Vapour* hath no *Weight*;) such as is the Matter of *Ignis Fatuus*. But then you will say, that that *Vapour* also can last but a short time: To that it may be answered, That by the helpe of *Oyle*, and *Wax*, and other *Candle-Stuffe*, the *Flame* may continue, and the *Wicke* not burne.

Experiment  
Solitary Oeco-  
nomicall tou-  
ching Cheape  
Fuell.

775

**S**ea-Coale last longer than Char-Coale; And Char-Coale of Roots, being coaled into great Peeces, last longer than Ordinary Char-Coale. Turfe and Peat, and Cow-Sheards, are cheape Fuels, and last long. Small-Coale, or Briar-Coale, powred upon Char-Coale, make them last longer. Sedge is a cheap Fuell to Brew, or Bake with; the rather because it is good for Nothing else. Triall would be made of some Mixture of Sea-Coale with Earth, or Chalke; For if that Mixture be, as the Sea-Coale-Men use it, privily, to make the Bulke of the Coale greater, it is Deceit; But if it bee used purpöfely, and bee made knowne, it is Saving.

Experiment  
Solitary, tou-  
ching the  
Gathering of  
Winde for  
Freshnesse.

776

**I**T is, at this Day, in use, in Gaza, to couch Pot-Sheards or Vessels of Earth, in their Walls, to gather the Wind from the Top, and to passe it downe in Spouts into Roomes. It is a Device for Freshnesse, in great Heats: And it is said, there are some Roomes in Italy, and Spaine, for Freshnesse, and Gathering the Winds, and Aire, in the Heats of Summer. But they be but Pennings of the Winds, and Enlarging them againe, and making them Reverberate, and goe Round in Circles, rather than this Device of Spouts in the Wall.

Experiment  
Solitary, tou-  
ching the  
Trials of  
Aires.

777

**T**Here would be used much diligence, in the Choice of some Bodies, and Places, (as it were,) for the Tasting of Aire; to discover the wholesomenesse, or Unwholesomenesse, as well of Seasons, as of the Seats of Dwellings. It is certaine, that there be some Houses, wherein Confitures, and Pies, will gather Mould, more than in Others. And I am perswaded, that a Peece of Raw Flesh, or Fish, will sooner corrupt in some Aires, than in Others. They bee noble Experiments, that can make this Discovery; For they serve for a Naturall Divination of Seasons; Better than the Astronomers can by their Figures: And againe, they teach Men where to chuse their Dwelling, for their better Health.

Experiment  
Solitary, tou-  
ching Increa-  
sing of Milke  
in Milch  
Beasts.

778

**T**Here is a Kinde of Stone, about Bethleem, which they grinde to Powder, and put into Water, whereof Cartell drinke; Which maketh them give more Milke. Surely, there would be some better Trialls made of Mixtures of Water in Ponds for Cartell, to make them more Milch; Or to Fatten-them; Or to Keepe them from Murraine. It may bee, Chalke, and Nitre, are of the best.

Experiment  
Solitary, tou-  
ching Sand  
of the Nature  
of Glasse.

779

**I**T is reported, that in the Valley, neare the Mountaine Carmel, in Iudea, there is a Sand, which, of all other, hath most Affinitie with Glasse; Inso-much as other Mineralls, laid in it, turne to a Glasse Substance, without the Fire; And againe Glasse put into it, turneth into the Mother-Sand. The Thing is very strange, if it betrue: And it is likeliest to be Caused by some Naturall Furnace, or Heat in the Earth: And yet they doe not speake of any Eruption of Flames. It were good to trie in Glasse-works, whether the Crude Materialls of Glasse, mingled with Glasse, already made and Re-moulten, doe not facilitate the Making of Glasse with lesse Heat.



**I**N the *Sea*, upon the *South-west* of *Sicily*, much *Corall* is found. It is a *Sub-Marine Plant*. It hath no *Leaves*: It brancheth onely when it is under *Water*; It is *Soft*, and *Greene* of *Colour*; But being brought into the *Aire*, it becommeth *Hard*, and *Shining Red*, as we see. It is said also, to have a *White Berry*; But we finde it not brought over with the *Corall*. Belike it is cast away as nothing worth: Inquire better of it, for the *Discovery* of the *Nature* of the *Plant*.

Experiment  
Solitary, touching the  
Growth of  
Corall.

780

**T**He *Manna* of *Calabria* is the best, and in most *Plenty*. They gather it from the *Leafe* of the *Mulberry Tree*; But not of such *Mulberry Trees*, as grow in the *Valley's*. And *Manna* falleth upon the *Leaves* by *Night*, as other *Deawes* doe. It should seem, that before those *Deawes* come upon *Trees* in the *Valley's*, they dissipate and cannot hold out. It should seeme also, the *Mulberry-Leafe*, it selfe hath some *Coagulating Vertue*, which inspissateth the *Deaw*, for that it is not found upon other *Trees*: And wee see by the *Silke-worme*, which feedeth upon that *Leafe*, what a *Dainty Smooth Iuyce* it hath; And the *Leaves* also, (especially of the *Blacke Mulberry*,) are somewhat *Bristly*, which may helpe to preserve the *Deaw*. Certainly, it were not amisse, to observe a little better, the *Deawes* that fall upon *Trees*, or *Herbs*, Growing on *Mountaines*; For it may bee, many *Deawes* fall, that spend before they come to the *Valley's*. And I suppose, that he that would gather the best *May-Deaw* for *Medicine*, should gather it from the *Hills*.

Experiment  
Solitary, touching the  
Gathering of  
Manna.

781

**I**T is said, they have a manner, to prepare their *Greeke-wines*, to keep them from *Fuming*, and *Inebriating*, by adding some *Sulphur*, or *Allome*: Whereof the one is *Vinctuous*, and the other is *Astringent*. And certaine it is, that those two *Natures* doe best repress *Fumes*. This *Experiment* would be transferred, unto other *Wine*, and *Strong Beere*, by Putting in some like *Substances*, while they worke; Which may make them both to *Fume* lesse, and to *In-flame* lesse.

Experiment  
Solitary, touching the  
Correcting of  
Wine.

782

**I**T is conceived by some, (not improbably,) that the reason, why *Wilde-Fires*, (Whereof the principall Ingredient is *Bitumen*,) doe not quench with *Water*; is, for that the first *Concretion* of *Bitumen*, is a *Mixture*, of a *Fie-ry*, and *Warry Substance*: So is not *Sulphur*. This appeareth, for that in the *Place* neare *Puteoli*, which they call the *Court of Vulcan*, you shall heare under the *Earth* a *Horrible Thundring of Fire*, and *Water*, conflicting together: And there breake forth also *Spouts of Boiling Water*. Now that *Place* yeeldeth great *Quantities* of *Bitumen*; Whereas *Aetna*, and *Vesuvius*, and the like, which consist upon *Sulphur*, shoot forth *Smoake*, and *Ashes*, and *Pumice*, but no *Water*. It is reported also, that *Bitumen* Mingled with *Lime*, and Put under *Water*, will make, as it were, an *Artificiall Rocke*; The *Substance* becommeth so *Hard*.

Experiment.  
Solitary, touching the  
Materialls of  
Wilde-Fire.

783

**T**Here is a *Cement*, compounded of *Flower*, *Whites of Egges*, and *Stone* powdered, that becommeth *Hard* as *Marble*; wherewith *Piscina Mirabilis*, neare *Cuma*, is said to have the *walls Plastered*. And it is certaine, and tried, that the *Powder of Load-Stone*, and *Flint*, by the Addition of *Whites of Egges*, and *Gumm-Dragon*, made into *Paste*, will in a few dayes harden to the *Hardnesse* of a *Stone*.

Experiment  
Solitary, touching  
Plaster  
growing as  
Hard as  
Marble.

784

It



Experiment  
Solitary, tou-  
ching Iudge-  
ment of the  
Cure in some  
Vlcers and  
Hurts.

785

**I**T hath beene noted by the *Ancients*, that in *Full*, or *Impure Bodies*, *Vlcers* or *Hurts* in the *Legges*, are *Hard to Cure*; And in the *Head* more easie. The *Cause* is, for that *Vlcers* or *Hurts* in the *Legges* require *Desiccation*, which by the *Defluxion* of *Humours* to the *Lower Parts* is hindred; Whereas *Hurts* and *Vlcers* in the *Head* require it not; But contrariwise *Drinesse* maketh them more apt to *Consolidate*. And in *Moderne Observation*, the like difference hath beene found, betweene *French-Men*, and *English-Men*; Whereof the ones *Constitution* is more *Drie*, and the others more *Moist*. And therefore a *Hurt* of the *Head* is harder to cure in a *French Man*, and of the *Legge* in an *English-Man*.

Experiment  
Solitary, tou-  
ching the  
Healthfulnesse  
or Unhealth-  
fulnesse of the  
Southerne  
Winde.

786

**I**T hath beene noted by the *Ancients*, that *Southerne Windes*, blowing much, without *Raine*, doe cause a *Favourous Disposition* of the *Yeare*; But with *Raine*, not. The *Cause* is, for that *Southerne Windes* doe, of themselves, qualifie the *Aire*, to be apt to cause *Fevers*; But when *Showers* are joyned, they doe *Refrigerate* in Part, and Checke the *Sultry Heat* of the *Southerne Winde*. Therefore this holdeth not in the *Sea-Coasts*, because the *Vapour* of the *Sea*, without *Showers*, doth refresh.

Experiment  
Solitary, tou-  
ching Wounds.

787

**I**T hath beene noted by the *Ancients*, that *Wounds* which are made with *Brasse*, heale more easily, than *Wounds* made with *Iron*. The *Cause* is, for that *Brasse* hath, in it selfe, a *Sanative Vertue*; And so in the very Instant helpeth somewhat: But *Iron* is *Corrosive*, and not *Sanative*. And therefore it were good, that the *Instruments* which are used by *Chirurgions* about *Wounds*, were rather of *Brasse*, than *Iron*.

Experiment  
Solitary, tou-  
ching Mortifi-  
cation by Cold.

788

**I**N the *Cold Countries*, when *Mens Noses*, and *Eares* are *Mortified*, and (as it were) *Gangrened* with *Cold*, if they come to a *Fire*, they rot off presently. The *Cause* is, for that the few *Spirits*, that remaine in those *Parts*, are suddenly drawne forth, and so *Putrefaction* is made *Compleat*. But *Snow* Put upon them, helpeth; For that it preserveth those *Spirits* that remaine, till they can revive; And besides, *Snow* hath in it a *Secret Warmth*: As the *Monke* proved out of the *Text*; *Qui dat Nivem sicut Lanam, Gelu sicut Cineres spargit*. Whereby he did inferre, that *Snow* did warme like *Wool*, and *Frost* did fret like *Asbes*. *Warme Water* also doth good; Because by little and little it openeth the *Pores*, without any sudden *Working* upon the *Spirits*. This *Experiment* may bee transferred unto the *Cure* of *Grangrenes*, either comming of themselves, or induced by too much applying of *Opiates*: Wherein you must beware of *Drie Heat*, and resort to Things that are *Refrigerant*, with an *Inward Warmth*, and *Vertue* of *Cherishing*.

Experiment  
Solitary, tou-  
ching Weight.

789

**W**Eigh *Iron*, and *Aqua Fortis*, severally; Then dissolve the *Iron* in the *Aqua Fortis*: And weigh the *Dissolution*; And you shall finde it to beare as good *Weight*, as the *Bodies* did severally: Notwithstanding a good deale of *Wast*, by a thicke *Vapour*, that issueth during the *Working*: Which sheweth that the *Opening* of a *Body*, doth increase the *Weight*. This was tried once, or twice, but I know not whether there were any *Errour*, in the *Triall*.

Experiment  
Solitary, tou-  
ching the  
Super-Nata-  
tion of Bodies.

790

**T**AKE of *Aqua Fortis* two *Ounces*, of *Quick-Silver* two *Drachmes*, (For that Charge the *Aqua Fortis* will bear,) The *Dissolution* will not beare a *Flint*, as big as a *Nutmeg*: Yet (no doubt) the *Increasing* of the *Weight* of *Wa-*



ter will increase his Power of Bearing; as we see *Broome*, when it is Salt enough, will beare an *Egge*. And I remember well a *Physician*, that used to give some Mineral Baths for the *Gout*, &c. And the *Body* when it was put into the Bath, could not get downe so easily, as in Ordinary *Water*. But it seemeth, the Weight of the *Quick-Silver*, more than the Weight of a *Stone*, doth not compensate the Weight of a *Stone*, more than the Weight of the *Aqua-Fortis*.

**L**et there be a Body of *Vnequall Weight*; (As of *VVood* and *Lead*, or *Bone* and *Lead*;) If you throw it from you with the *Light-End* forward, it will turne, and the *VVeightier End* will recover to be Forwards; Unlessse the *Body* be Over-long. The Cause is, for that the more *Dense Body*, hath a more Violent *Pressure* of the Parts, from the first *Impulsion*; Which is the Cause, (though heretofore not found out, as hath beene often said,) of all Violent *Motions*: And when the *Hinder Part* moveth swifter, (for that it lesse endureth *Pressure* of Parts,) than the *Forward Part* can make way for it, it must needs be, that the *Body* turn over: For (turned) it can more easily draw forward the *Lighter Part*. *Galileus* noteth it well; That if an *Open Trough*, wherein *VVater* is, be driven faster then the *VVater* can follow, the *VVater* gathereth upon an heape, towards the *Hinder End*, where the *Motion* began; Which he supposeth, (holding confidently the *Motion* of the *Earth*;) to bee the Cause of the *Ebbing* and *Flowing* of the *Ocean*; Because the *Earth* over-runneeth the *VVater*. Which *Theory*, though it be false, yet the first *Experiment* is true. As for the *Inequality* of the *Pressure* of Parts, it appeareth manifestly in this; That if you take a *Body* of *Stone*, or *Iron*, and another of *VVood*, of the same *Magnitude*, and *Shape*, and throw them with equall Force, you cannot possibly throw the *VVood*, so farre, as the *Stone*, or *Iron*.

**I**T is certaine, (as it hath beene formerly, in part, touched,) that *VVater* may be the *Medium* of *Sounds*. If you dash a *Stone* against a *Stone* in the *Bottom* of the *VVater*, it maketh a *Sound*. So a long *Pole* struck upon *Gravell*, in the *Bottom* of the *VVater*, maketh a *Sound*. Nay, if you should thinke that the *Sound* commeth up by the *Pole*, and not by the *VVater*, you shall finde that an *Anchor*, let downe by a *Roape*, maketh a *Sound*; And yet the *Roape* is no *Solide Body*, whereby the *Sound* can ascend.

**A**LL *Objects* of the *Senses*, which are very *Offensive*, doe cause the *Spirits* to retire; And upon their *Flight*, the *Parts* are (in some degree) destitute; And so there is induced in them a *Trepidation* and *Horror*. For *Sounds*, we see that the *Grating* of a *Saw*, or any very *Harsh Noise*, will set the *Teeth* on edge, and make all the *Body* Shiver. For *Tastes*, wee see, that in the Taking of a *Potion*, or *Pills*, the *Head*, and the *Necke*, shake. For *Odious Smells*, the like Effect followeth, which is lesse perceived, because there is a Remedy at hand, by *Stopping* of the *Nose*. But in *Horses*, that can use no such *Help*, we see the *Smell* of a *Carrion*, especially of a *Dead Horse*, maketh them fly away, and take on, almost as if they were Mad. For *Feeling*, if you come out of the *Sunne*, suddenly, into a *Shade*, there followeth a *Chillnesse* or *Shivering* in all the *Body*. And even in *Sight*, which hath (in effect) no *Odious Object*, *Comming* into *Sudden Darknesse*, induceth an *Offer* to *Shiver*.

**T**Here is, in the *City* of *Ticinum*, in *Italy*, a *Church*, that hath *Windowes* only from above: It is in Length an *Hundred Feet*, in Breadth *Twenty Feet*, and in Height neare *Fifty*; Having a *Doore* in the *Middest*. It reporteth

Experiment  
Solitary, touching the  
Flying of Vnequall Bodies  
in the Aire.

791

Experiment  
Solitary, touching water,  
that it may be  
the Medium  
of Sounds.

792

Experiment  
Solitary of the  
Flight of the  
Spirits upon  
Odious Objects

793

Experiment  
Solitary, touching the  
Super-Reflexion  
of Ecclesi.

794



porteth the *Voice*, twelve or thirteene times, if you stand by the *Close End-wall*, over against the *Doore*. The *Eccho* fadeth, and dyeth by little and little, as the *Eccho* at *Pont-charenton* doth. And the *Voice* foundeth, as if it came from above the *Doore*. And if you stand at the *Lower End*, or on either *Side* of the *Doore*, the *Eccho* holdeth; But if you stand in the *Doore*, or in the *Middest* just over against the *Doore*, not. Note that all *Eccho's* sound better against *Old walls*, than *New*; Because they are more *Drie*, and *Hollow*.

Experiment  
Solitary, touching the  
Force of Imagination, Imitating that of the Sense.

795

Those *Effects*, which are wrought by the *Percussion* of the *Sense*, and by *Things* in *Fa<sup>t</sup>*, are produced likewise in some degree, by the *Imagination*. Therefore if a Man see another eat *Soure* or *Acide Things*, which set the *Teeth* on edge, this *Object* tainteth the *Imagination*. So that he that seeth the *Thing* done by another, hath his own *Teeth* also set on edge. So if a Man see another turne swiftly, and long; Or if he look upon *Wheeles* that turne, Himselfe waxeth *Turne-sick*. So if a Man be upon an *High Place*, without *Railes*, or good *Hold*, except he be used to it, he is Ready to *Fall*: For *Imagining a Fall*, it putteth his *Spirits* into the very *Action* of a *Fall*. So Many upon the *Seeing* of others *Bleed*, or *Strangled*, or *Tortured*, Themselves are ready to faint, as if they *Bled*, or were in *Strife*.

Experiment  
Solitary, touching Preservation of Bodies.

796

Take a *Stoeke-Gilly-Flower*, and tie it gently upon a *Stick*, and put them both into a *Stoope Glasse*, full of *Quick-silver*, so that the *Flower* bee covered: Then lay a little *Weight* upon the *Top* of the *Glasse*, that may keepe the *Sticke* downe; And looke upon them after *four* or *five* *dayes*; And you shall finde the *Flower* *Fresh*, and the *Stalke* *Harder*, and lesse *Flexible*, than it was. If you compare it with another *Flower*, gathered at the same time, it will be the more manifest. This sheweth that *Bodies* doe preserve excellently in *Quick-silver*; And not preserve onely, but, by the *Coldnesse* of the *Quick-silver*, *Indurate*; For the *Freshnesse* of the *Flower* may be meerely *Conservation*; (which is the more to be observed, because the *Quick-silver* preserveth the *Flower*;) But the *Stiffenesse* of the *Stalke*, cannot be without *Induration*, from the *Cold* (as it seemeth,) of the *Quick-silver*.

Experiment  
Solitary, touching the Growth, or Multiplying of Metals.

797

It is reported by some of the *Ancients*, that in *Cyprus*, there is a *Kinde* of *Iron*, that being cut into *Little Peeces*, and put into the *Ground*, if it bee well *watered*, will increase into *Greater Peeces*. This is certaine, and knowne of *Old*; That *Lead* will multiply, and Increase; As hath been seene in *Old Statua's* of *Stone*, which have beene put in *Cellars*; The *Feet* of them being bound with *Leaden Bands*; Where (after a time) there appeared, that the *Lead* did swell; Insomuch as it hanged upon the *Stone* like *Warts*.

Experiment  
Solitary, touching the Drowning of the more Base Metall in the more Precious.

798

I Call *Drowning* of *Metals*, when that the *Base Metall*, is so incorporate with the more *Rich*, as it can by no *Meanes* bee separated againe: which is a kinde of *Version*, though *False*: As if *Silver* should be inseparably incorporated with *Gold*; Or *Copper*, and *Lead*, with *Silver*. The *Ancient Electrum* had in it a *Fifth* of *Silver* to the *Gold*; And made a *Compound Metall*, as fit for most uses, as *Gold*; And more *Resplendent*, and more *Qualified* in some other *Properties*; But then that was easily *Separated*. This to doe privily, or to make the *Compound* passe for the *Rich Metall* Simple, is an *Adulteration*, or *Counterfeiting*: But if it bee done *Avowedly*, and without *Disguizing*, it may be a great *Saving* of the *Richer Metall*. I remember to have heard of a Man, skilfull in *Metalls*, that a *Fifteenth Part* of *Silver*, incorporate with

Gold,



Gold, will not be Recovered by any *Water of Separation*; Except you put a Greater *Quantitie* of *Silver*, to draw to it the *Lesse*; which (hee said) is the last Refuge in *Separations*. But that is a tedious way, which no Man (almost) will thinke on. This would be better enquired; And the *Quantity* of the Fifteenth turned to a Twentieth; And likewise with some little *Additionall*, that may further the *Intrinsique Incorporation*. Note that *Silver* in *Gold* will be detected by *Weight*, compared with the *Dimension*; But *Lead* in *Silver*, (*Lead* being the *Weightier Metall*.) will not be detected; If you take so much the more *Silver*, as will countervaile the *Over-weight* of the *Lead*.

**G**old is the onely *Substance*, which hath nothing in it *Volatile*, and yet melteth without much difficultie. The *Melting* sheweth that it is not Jeune, or Scarce in *Spirit*. So that the *Fixing* of it, is not want of *Spirit* to fly out, but the *Equall Spreading* of the *Tangible Parts*, and the *Close Coacervation* of them: Whereby they have the lesse Appetite, and no Meanes (at all) to issue forth. It were good therefore to trie, whether *Glasse Re-moulten* doe leese any *Weight*? For the *Parts* in *Glasse* are evenly Spred; But they are not so Close as in *Gold*; As we see by the Easie Admission of *Light*, *Heat*, and *Cold*; And by the *Smallnesse* of the *Weight*. There be other *Bodies*, *Fixed*, which have little, or no *Spirit*: So as there is nothing to fly out; As we see in the *Stuffe*, where of *Coppells* are made; Which they put into *Furnaces*; Upon which *Fire* worketh not: So that there are three *Causes* of *Fixation*; The *Even Spreading* both of the *Spirits*, and *Tangible Parts*; The *Closenesse* of the *Tangible Parts*; And the *Iejunenesse* or *Extreme Communion* of *Spirits*: Of which Three, the two First may bee joyned with a *Nature Liquefiable*; The Last not.

**I**t is a Profound *Contemplation in Nature*, to consider of the *Emptinesse*, (as we may call it,) or *Insatisfaction* of severall *Bodies*; And of their *Appetite* to take in Others. *Aire* taketh in *Lights*, and *Sounds*, and *Smells*, and *Vapours*; And it is most manifest, that it doth it with a kinde of Thirst, as not satisfied with his owne former Consistence; For else it would never receive them in so suddenly, and easily. *Water*, and all *Liquours*, doe hastily receive *Drie* and more *Terrestriall Bodies*, Proportionable: And *Drie Bodies*, on the other side, drinke in *Waters*, and *Liquours*: So that, (as it was well said, by one of the *Ancients*, of *Earthy* and *Vary Substances*.) *One is a Glue to another*, *Parchments*, *Skins*, *Cloth*, &c. drinke in *Liquours*, though themselves be *Entire Bodies*, and not *Comminuted*, as *Sand*, and *Asbes*; Not apparently Porous: *Metalls* themselves doe receive in readily *Strong-waters*; And *Strong-waters* likewise doe readily pierce into *Metalls*, and *Stones*: And that *Strong-water* will touch upon *Gold*, that will not touch upon *Silver*; And *e Converso*. And *Gold*, which seemeth by the *Weight*, to be the Closest, and most Solide *Body*, doth greedily drink in *Quick-Silver*. And it seemeth, that this *Reception* of other *Bodies*, is not Violent: For it is (many times) *Reciprocall*, and as it were with Consent. Of the *Cause* of this, and to what *Axiome* it may bee referred, consider attentively; For as for the Pretty *Assertion*, that *Matter* is like a *Common Strumpet*, that desireth all *Formes*, it is but a *Vandering Notion*. Onely *Flame* doth not content it selfe to take

in any other *Body*; But either to overcome and turne another *Body* into it Selfe, as by *Victory*; Or

it Selfe to dye, and

goe out.

Experiment  
Solitary, touching  
Fixation of Bodies.

799

Experiment  
Solitary, touching the  
Resilience Nature of Things  
in Themselves, and their Desire  
to Change.

800

NATU-









# NATVRALL HISTORIE.

## IX. Century.



IT is certaine, that all *Bodies* whatsoever, though they have no *Sense*, yet they have *Perception*: For when one *Body* is applyed to another, there is a Kinde of *Election*, to embrace that which is Agreeable, and to exclude or expell that which is Ingrate: And whether the *Body* be *Alterant*, or *Altered*, evermore a *Perception* precedeth *Operation*: For else all *Bodies* would be alike One to Another. And sometimes this *Perception*, in some Kinde of *Bodies*, is farre more Subtill than the *Sense*; So that the *Sense* is but a dull thing in Comparison of it: Wee see a *Weather-Glasse*, will finde the least difference of the *Weather*, in *Heat*, or *Cold*, when Men finde it not. And this *Perception* also, is sometimes at *Distance*, as well as upon the *Touch*; As when the *Load-Stone* draweth *Iron*; or *Flame* fireth *Naphtha* of *Babylon*, a great distance off. It is therefore a *Subject* of a very *Noble Enquiry*, to enquire of the more *Subtill Perceptions*; For it is another *Key* to open *Nature*, as well as the *Sense*; And sometimes Better. And besides, it is a *Principall Meanes* of *Naturall Divination*; For that which in these *Perceptions* appeareth early, in the great *Effects* commeth long after. It is true also, that it serveth to discover that which is *Hid*, as well as to foretell that which is to

Experiments  
in Consort,  
touching Per-  
ception in Bo-  
dies Insensible,  
tending to  
Naturall Divi-  
nation, or  
Subtill Trialls.



Come ; As it is in many *Subtill Trialls* ; As to trie whether *Seeds* be old, or new, the *Sense* cannot informe : But if you boile them in *Water*, the New *Seeds* will sprout sooner : And so of *Water*, the *Taste* will not discover the best *Water* ; but the *Speedy Consuming* of it, and many other *Meanes*, which wee have heretofore set downe, will discover it. So in all *Physiognomy*, the *Lineaments* of the *Body* will discover those *Naturall Inclinations* of the *Minde*, which *Disimulation* will conceale, or *Discipline* will suppress. Wee shall therefore now handle onely, those two *Perceptions*, which pertaine to *Naturall Divination*, and *Discovery* : Leaving the Handling of *Perception* in other Things, to be disposed Elsewhere. Now it is true, that *Divination* is attained by other *Meanes* ; As if you know the *Causes* ; If you know the *Concomitants* ; you may judge of the *Effect* to follow : And the like may be said of *Discovery*, But we tie our Selves here, to that *Divination* and *Discovery* chiefly, which is Caused by an *Early*, or *Subtill Perception*.

The *Aptnesse* or *Propension* of *Aire*, or *Water*, to Corrupt or Putrifie, (no doubt,) is to be found before it breake forth into manifest *Effects* of *Diseases*, *Blasting*, or the like. Wee will therefore set downe some *Prognosticks* of *Pestilentiall* and *Vnwholesome Teares*.

801

The *wind* blowing much from the *South*, without *Raine* ; And *Wormes* in the *Oake-Apple* ; have beene spoken of before. Also the *Plenty* of *Frogs*, *Grashoppers*, *Flies*, and the like *Creatures* bred of *Putrefaction*, doth portend *Pestilentiall Yeares*.

802

*Great*, and *Early Heats* in the *Spring*, (and namely in *May*), without *winds*, portend the same ; And generally so doe *Yeares* with little *Wind*, or *Thunder*.

803

*Great Droughts* in *Summer*, lasting till towards the *End* of *August*, and some *Gentle Showres* upon them ; And then some *Drie Weather* againe ; Doe portend a *Pestilent Summer*, the *Yeare* following : For about the *End* of *August*, all the *Sweetnesse* of the *Earth*, which goeth into *Plants*, and *Trees*, is exhaled ; (And much more if the *August* be drie ; ) So that nothing then can breathe forth of the *Earth*, but a grosse *Vapour*, which is apt to Corrupt the *Aire* : And that *Vapour*, by the first *Showres*, if they be *Gentle*, is released, and commeth forth abundantly. Therefore they that come abroad soone after those *Showres*, are commonly taken with *Sicknesse* : And in *Affricke*, no *Body* will stirre out of doores, after the first *Showres*. But if the first *Showres* come vehemently, then they rather wash and fill the *Earth*, than give it leave to breathe forth presently. But if *Drie Weather* come againe, then it fixeth and continueth the *Corruption* of the *Aire*, upon the first *Showres* begun ; And maketh it of ill *Influence*, even to the *Next Summer* ; Except a very *Frostie Winter* discharge it ; Which seldome succeedeth such *Droughts*.

804

The *Lesser Infections*, of the *Small Pocks*, *Purple Feavers*, *Agues*, in the *Sum-*

mer



mer Precedent, and hovering all winter, doe portend a great Pestilence in the Summer following; For Putrefaction doth not rise to his height at once.

It were good to lay a Peece of Raw Flesh, or Fish, in the Open Aire; And if it Putrefie quickly, it is a Signe of a Disposition in the Aire to Putrefaction. And because you cannot be informed, whether the Putrefaction be quicke or late, except you compare this Experiment with the like Experiment in another Yeare, it were not amisse in the same Yeare, and at the same Time, to lay one Peece of Flesh, or Fish, in the Open Aire, and another of the same Kinde and Bignesse, within Doores: For I Judge, that if a generall Disposition be in the Aire to Putrefie, the Flesh, or Fish, will sooner Putrefie abroad, where the Aire hath more power, than in the House, where it hath lesse, being many wayes corrected. And this Experiment would be made about the End of March: For that Season is likest to discover, what the winter hath done; And what the Summer following will doe upon the Aire. And because the Aire (no doubt) receiveth great Tincture, and Infusion from the Earth; It were good to trie that Exposing of Flesh, or Fish, both upon a Stake of Wood, some height above the Earth, and upon the Flat of the Earth.

Take May-Dew, and see whether it putrefie quickly, or no? For that likewise may disclose the Quality of the Aire, and Vapour of the Earth, more or lesse Corrupted.

A Drie March, and a Drie May, portend a wholesome Summer, if there bee a Showring April betweene: But otherwise, it is a Signe of a Pestilentiall Yeare.

As the Discoverie of the Disposition of the Aire, is good for the Prognosticks of wholesome, and Unwholesome Yeares; So it is of much more use, for the Choice of Places to dwell in: At the least, for Lodges, and Retiring Places for Health; (For Mansion Houses respect Provisions, as well as Health;) Wherein the Experiments above mentioned may serve.

But for the Choice of Places, or Seats, it is good to make Triall, not onely of Aptnesse of Aire to corrupt, but also of the Moisture and Driness of the Aire; and the Temper of it, in Heat, or Cold; For that may concerne Health diversly. We see that there be some Houses, wherein Sweet Meats will relent, and Baked Meats will mould, more than in others; And Wainscoats will will also sweat more; so that they will almost runne with Water: All which, (no doubt,) are caused chiefly by the Moistnesse of the Aire, in those Seats. But because it is better to know it, before a Man buildeth his House, than to finde it after, take the Experiments following.

Lay wooll, or a Sponge, or Bread, in the Place you would trie, comparing it with some other Places; And see whether it doth not moisten, and make the wooll, or Sponge, &c. more Ponderous, than the other? And if it doe, you may judge of that Place, as Situate in a Grosse, and Moist Aire.

Because it is certaine, that in some Places, either by the Nature of the Earth, or by the Situation of Woods, and Hills, the Aire is more Unequall, than in Others; And Inequality of Aire is ever an Enemy to Health; It were good to take two Weather-Glasses, Matches in all things, and to set them, for the same Houres of One day, in severall Places, where no Shade is, nor Enclosures: And to marke when you set them, how farre the Water commeth; And to compare them, when you come againe, how the Water standeth then: And if you finde them Unequall, you may be sure that the Place where the Water is lowest, is in the Warmer Aire, and the other in the Colder. And the greater the Inequality be, of the Ascent, or Descent of the Water, the greater is the Inequality of the Temper of the Aire.



812

The *Predictions* likewise of *Cold* and *Long Winters*, and *Hot* and *Drie Summers*, are good to be knowne; As well for the *Discovery* of the *Causes*, as for divers *Provisions*. That of *Plenty* of *Hawes* and *Heps*, and *Briar-Berries*, hath beene spoken of before. If *VVainscoat*, or *Stone*, that have used to *Sweat*, be more drie in the *Beginning* of *Winter*; Or the *Drops* of the *Eaves* of *Houses* come more slowly downe, than they use; it portendeth a *Hard* and *Frostie Winter*. The *Cause* is, for that it sheweth an *Inclination* of the *Aire*, to *Drie Weather*; which in *Winter* is ever joyned with *Frost*.

813

Generally, a *Moist* and a *Coole Summer*, portendeth a *Hard Winter*. The *Cause* is, for that the *Vapours* of the *Earth*, are not dissipated in the *Summer*, by the *Sunne*; And so they rebound upon the *Winter*.

814

A *Hot* and *Drie Summer*, and *Autumne*, and especially if the *Heat* and *Drought* extend farre into *September*, portendeth an *Open Beginning* of *Winter*; And *Colds* to succeed, toward the latter Part of the *Winter*, and the *Beginning* of the *Spring*: For till then, the former *Heat* and *Drought* beare the *Sway*; And the *Vapours* are not sufficiently *Multiplied*.

815

An *Open* and *Warme Winter* portendeth a *Hot* and *Drie Summer*: For the *Vapours* disperse into the *Winter Showers*; Whereas *Cold* and *Frost* keepeth them in, and transporteth them into the late *Spring*, and *Summer* following.

816

*Birds* that use to change *Countries*, at certaine *Seasons*, if they come *Earlier*, doe shew the *Temperature* of *Weather*, according to that *Countrie* whence they came: As the *Winter-Birds*, (namely, *Woodcocks*, *Feldefares*, &c.) if they come earlier, and out of the *Northerne Countries*, with us shew *Cold Winters*. And if it be in the same *Countrie*, then they shew a *Temperature* of *Season*, like unto that *Season* in which they come: As *Swallows*, *Bats*, *Cuckoos*, &c. that come towards *Summer*, if they come early, shew a *Hot Summer* to follow.

817

The *Prognosticks*, more *Immediate*, of *Weather* to follow soone after, are more *Certaine* than those of *Seasons*. The *Resounding* of the *Sea* upon the *Shoare*; And the *Murmur* of *Winds* in the *Woods*, without apparent *Wind*, shew *Wind* to follow: For such *Winds*, breathing chiefly out of the *Earth*, are not at the first perceived, except they be pent, by *Water*, or *Wood*. And therefore a *Murmur* out of *Caves* likewise portendeth as much.

818

The *Upper Regions* of the *Aire*, perceive the *Collection* of the *Matter* of *Tempest*, and *Winds*, before the *Aire* here below: And therefore the *Obscuring* of the *Smaller Starres* is a *Signe* of *Tempests* following. And of this kind you shall finde a *Number* of *Instances* in our *Inquisition De Ventis*.

819

*Great Mountaines* have a *Perception* of the *Disposition* of the *Aire* to *Tempests*, sooner than the *Valley's* or *Plaines* below: And therefore they say in *VVales*, when certaine *Hills* have their *Night-Caps* on, they meane *Mischiefe*. The *Cause* is, for that *Tempests*, which are for the most part bred above, in the *Middle Region*, (as they call it,) are soonest perceived to collect in the *Places* next it.

820

The *Aire*, and *Fire*, have *Subrill Perceptions* of *Wind Rising*, before *Men* finde it. We see the *Trembling* of a *Candle* will discover a *Wind* that otherwise we doe not feele; And the *Flexuons Burning* of *Flames* doth shew the *Aire* beginneth to be unquiet; And so doe *Coales* of *Fire* by casting off the *Ashes* more then they use. The *Cause* is, for that no *Wind*, at the first, till it hath strooke and driven the *Aire*, is *Apparent* to the *Sense*: But *Flame* is easier to move, than *Aire*: And for the *Ashes*, it is no marvell, though *Wind* unperceived shake them off; For wee usually trie, which way the *Wind* bloweth,



bloweth, by casting up *Grasse*, or *Chasse*, or such light things into the *Aire*.

When *wind* expireth from under the *Sea*; As it causeth some *Resounding* of the *Water*, (whereof we spake before,) so it causeth some *Light Motions* of *Bubbles*, and *White Circles* of *Froth*. The *Cause* is, for that the *wind* cannot be perceived by the *Sense*, untill there be an *Eruption* of a great *Quantity*, from under the *Water*; And so it getteth into a *Body*: Whereas in the first *Putting up* it commeth in little *Portions*.

We spake of the *Asher*, that *Coales* cast off; And of *Grasse*, and *Chasse* carried by the *wind*; So any *Light Thing* that moveth, when we finde no *wind*, sheweth a *wind* at hand: As when *Feathers*, or *Downe* of *Thistles*, fly to and fro in the *Aire*.

For *Prognosticks* of *Weather* from *Living Creatures*, it is to be noted; That *Creatures* that live in the *Open Aire*, (*Sub Div*;) must needs have a *Quicker Impression* from the *Aire*, than *Men* that live most within *Doores*; And especially *Birds* who live in the *Aire*, freest, and *Clearest*; And are aptest by their *Voice* to tell *Tales*, what they finde; And likewise by the *Motion* of their *Flight* to expresse the same.

*Water-Fowles*, (as *Sea-Gulls*, *More-Hens*, &c.) when they flocke and flie together, from the *Sea* towards the *Shores*; And contrariwise, *Land-Birds*, (as *Crowes*, *Swallowes*, &c.) when they fly from the *Land* to the *Waters*, and beat the *Waters* with their *wings*; doe fore-shew *Raine*, and *wind*. The *Cause* is, *Pleasure*, that both *Kindes* take in the *Moistnesse*, and *Densitie* of the *Aire*: And so desire to be in *Motion*, and upon the *wing*, whithersoever they would otherwise goe: For it is no *Marvell*, that *Water-Fowle* doe joy most in that *Aire*, which is likest *Water*; And *Land-Birds*, also, (many of them,) delight in *Babing*, and *Moist Aire*. For the same Reason also, many *Birds* doe proine their *Feathers*; And *Geese* doe gaggle; And *Crowes* seeme to call upon *Raine*: All which is but the *Comfort* they seeme to receive in the *Relenting* of the *Aire*.

The *Heron*, when she soareth high, (so as sometimes she is seene to passe over a *Cloud*;) sheweth *Winds*: But *Kites* flying aloft, shew *Faire* and *Drie Weather*. The *Cause* may be, for that they both mount most into the *Aire*, of that *Temper*, wherein they delight: And the *Heron*, being a *Water-Fowle*, taketh pleasure in the *Aire*, that is *Condensed*: And besides, being but *Heavy* of *wing*, needeth the Help of the *Grosser Aire*. But the *Kite* affecteth not so much the *Grossnesse* of the *Aire*, as the *Cold* and *Freshnesse* thereof. For being a *Bird of Prey*, and therefore *Hot*, she delighteth in the *Fresh Aire*; And (many times) flyeth against the *wind*; As *Trouns*, and *Salmons* swimme against the *Streame*. And yet it is true also, that all *Birds* finde an *Ease* in the depth of the *Aire*; As *Swimmers* doe in a *Deepe Water*. And therefore when they are aloft, they can uphold themselves with their *wings* *Spred*, scarce moving them.

*Fishes*, when they play towards the *Top* of the *Water*, doe commonly fore-tell *Raine*. The *Cause* is, for that a *Fish* hating the *Drie*, will not approach the *Aire*, till it groweth *Moist*; And when it is *Dry*, will fly it, and swimme lower.

*Beasts* doe take *Comfort*, (generally,) in a *Moist Aire*; And it maketh them eat their *Mear* better: And therefore *Sheepe* will get up betimes in the

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825

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113

the Morning, to feed, against *Raine*: And *Cattell*, and *Deere*, and *Conneys*, will feed hard before *Raine*: And a *Heifer*, will put up his *Nose*, and snuffe in the *Aire*, against *Raine*.

827

The *Trifoile*, against *Raine*, swelleth in the *Stalke*; and so standeth more upright; For by *Wet*, *Stalkes* doe erect, and *Leaves* bow downe. There is a Small Red Flower in the *Stubble-Fields*, which Countrey People call the *Wincopipe*; Which if it open in the *Morning*, you may be sure of a faire *Day* to follow.

828

Even in *Men*, *Aches*, and *Huris*, and *Cornes*, doe engrieve, either towards *Raine*, or towards *Frost*: For the One maketh the *Humours* more to Abound; And the Other maketh them Sharper. So we see both *Extremes* bring the *Gout*.

829

*Wormes*, *Vermine*, &c. doe fore-shew (likewise) *Raine*: For *Earth-Wormes* will come forth, and *Moules* will cast up more, and *Fleas* bite more, against *Raine*.

830

*Solide Bodies* likewise fore-shew *Raine*. As *Stones*, and *Wainscot*, when they *Sweat*: And *Boxes*, and *Pegges* of *Wood*, when they *Draw*, and *Wind* hard; Though the Former be but from an Outward Cause; For that the *Stone*, or *Wainscot*, turneth and beateth back the *Aire* against it selfe; But the latter is an *Inward Swelling* of the *Body* of the *Wood* it selfe.

Experiment  
Solitary, touch-  
ing the  
Nature of  
Appetite in the  
Stomach.

831

**A**ppetite is moved chiefly by Things that are *Cold*, and *Dry*; The Cause is, for that *Cold* is a Kinde of *Indigence* of Nature, and calleth upon Supply; And so is *Driness*: And therefore all *Soure Things*, (as *Vinegar*, *Juyce* of *Lemons*, *Oyle* of *Virioll*, &c.) provoke *Appetite*. And the Disease which they call *Appetitus Caninus*, consisteth in the Matter of an *Acide* and *Glassy Flegme*, in the Mouth of the *Stomach*. *Appetite* is also moved by *Soure Things*; For that *Soure Things*, induce a *Contraction* in the *Nerves*, placed in the Mouth of the *Stomach*, which is a great Cause of *Appetite*. As for the Cause, why *Onyons*, and *Salt*, and *Pepper*, in Baked Meats, move *Appetite*, it is by *Vellication* of those *Nerves*; For *Motion* whetteth. As for *Worme wood*, *Olives*, *Capers*, and others of that kinde, which participate of *Bitternesse*, they move *Appetite* by *Absterfion*. So as there bee foure Principall Causes of *Appetite*; The *Refrigeration* of the *Stomach* joyned with some *Driness*; *Contraction*; *Vellication*; And *Absterfion*: Besides *Hunger*, which is an *Emptinesse*: And yet *Over-Fasting* doth (many times) cause the *Appetite* to cease; For that *Want* of *Meat* maketh the *Stomach* draw *Humours*; And such *Humours* as are *Light*, and *Cholericke*, which quench *Appetite* most.

Experiment  
Solitary, touch-  
ing Sweet-  
nesse of Odour  
from the  
Rainbow.

832

**I**T hath beene observed by the *Ancients*, that where a *Raine-Bow* seemeth to hang over, or to touch, there breatheth forth a *Sweet Smell*. The Cause is, for that this happeneth but in certain Matters, which have in themselves some *Sweetnesse*; Which the *Gentle Dew* of the *Raine-Bow* doth draw forth: And the like doe *Soft Showers*; For they also make the *Ground* *Sweet*: But none are so delicate as the *Dew* of the *Rain-Bow*, where it falleth. It may be also, that the *Water* it selfe hath some *Sweetnesse*: For the *Raine-Bow* consisteth of a *Glomeration* of *Small Drops*, which cannot possibly fall, but from the *Aire*, that is very *Low*: And therefore may hold the very *Sweetnesse* of the *Herbs*, and *Flowers*, as a *Distilled Water*: For *Raine*, and other *Dew*, that fall from high, cannot preserve the *Smell*, being dissipated in the drawing up: neither doe we know, whether some *Water* it selfe may not have some degree of *Sweetnesse*. It is true, that wee finde it sensibly in no *Poole*, *River*,

nor



nor Fountaine; But good Earth, newly turned up, hath a Freshnesse, and good Sent; Which water, if it be not too Equall, (For Equall Objects never move the Sense,) may also have. Certaine it is, that Bay-Salt, which is but a kinde of Water Congealed, will sometimes smell like Violets.

**T**O Sweet Smells Heat is requisite, to Concoct the Matter; And some Moisture to Spread the Breath of them. For Hear, we see that Woods, and Spices, are more Odorate in the Hot Countries, than in the Cold: For Moisture, wee see that Things too much Dried, lose their Sweetnesse: And Flowers growing, smell better in a Morning, or Evening, than at Noone. Some Sweet Smells are destroyed by Approach to the Fire; As Violets, wall-Flowers, Gilly-Flowers, Pincks; And generally all Flowers that have Coole and Delicate Spirits. Some continue both on the Fire, and from the Fire; As Rose-Water, &c. Some doe scarce come forth, or at least not so pleasantly, as by means of the Fire; as Iuniper, Sweet Gums, &c. And all Smells, that are Enclosed in a Fast Body: But (generally) those Smells are the most Gratefull, where the Degree of Heat is Small; Or where the Strength of the Smell is allayed; For these Things doe rather wooe the Sense, than Satiare it. And therefore the Smell of Violets, and Roses exceedeth in Sweetnesse that of Spices, and Gummes; And the Strongest Sort of Smells, are best in a weft, as farre off.

**I**T is certaine, that no Smell issueth, but with Emission of some Corporeall Substance; Not as it is in Light, and Colours, and in Sounds. For we see plainly, that Smell doth spread nothing that distance, that the other doe. It is true, that some Woods of Orenge, and Heathes of Rose-Mary, will Smell a great way into the Sea, perhaps twenty Miles; But what is that, since a Peale of Ordnance will doe as much, which moveth in a small compasse? Whereas those Woods, and Heathes, are of Vast Spaces: Besides, we see that Smells doe adhere to Hard Bodies; As in Perfuming of Gloves, &c. which sheweth them Corporeall; And doe Last a great while, which Sounds, and Light doe not.

**T**He Excrements of most Creatures Smell ill; Chiefly to the same Creature that voideth them: For we see, besides that of Man, that Pigeons, and Horses thrive best, if their Houses, and Stables be kept Sweet; And so of Cage-Birds: And the Cat buryeth that which she voideth: And it holdeth chiefly in those Beasts, which feed upon Flesh. Dogs (almost) onely of Beasts delight in Fetide Odours; Which sheweth there is somewhat in their Sense of Smell, differing from the Smells of other Beasts. But the Cause, why Excrements smell ill, is manifest; For that the Body it selfe rejecteth them; Much more the Spirits: And wee see, that those Excrements that are of the First Digestion, Smell the worst; As the Excrements, from the Belly: Those that are from the Second Digestion, lesse ill; As Urine; And those that are from the Third, yet lesse; For Sweat is not so bad, as the other two; Especially of some Persons, that are full of Heat. Likewise most Putrefactions are of an Odious Smell: For they smell either Fetide, or Mouldy. The Cause may bee, for that Putrefaction doth bring forth such a Consistence, as is most Contrary to the Consistence of the Body, whilest it is Sound: For it is a meere dissolution of that Forme. Besides, there is another Reason which is Profound: And it is, that the Objects that please any of the Senses, have (all) some Equalitie, and (as it were) Order in their Composition: But where those are wanting, the Object is ever Ingrate. So Mixture of many Disagreeing Colours

Experiment  
Solitary, touching Sweet  
Smells.

833

Experiment  
Solitary, touching the  
Corporeall  
Substance of  
Smells.

834

Experiment  
Solitary, touching Fetide  
and Fragrant  
Odours.

835

is



is ever unpleasant to the Eye: *Mixture of Discordant Sounds* is unpleasant to the Eare: *Mixture*, or *Hotch-Potch* of many *Tastes*, is unpleasant to the Taste: *Harshnesse* and *Ruggednesse* of *Bodies*, is unpleasant to the Touch: Now it is certaine, that all *Putrefaction*, being a *Dissolution* of the first *Forme*, is a meere *Confusion*, and *Unformed Mixture* of the *Part*. Neverthelessse, it is strange, and seemeth to *Crosse* the former *Observation*, that some *Putrefactions* and *Excrements* doe yeeld excellent *Odours*; As *Civet*, and *Muske*; And as some thinke *Amber-Greece*: For divers take it, (though unprobably,) to come from the *Sperme* of *Fish*: And the *Mosse* we spake off from *Apple-Trees*, is little better than an *Excretion*. The Reason may be, for that there passeth in the *Excrements*, and remaineth in the *Putrefactions*, some good *Spirits*; especially where they proceed from *Creatures*, that are very *Hot*. But it may bee also joyned with a further *Cause*, which is more *Subtill*; And it is, that the *Senses* love not to be *Over-pleased*; But to have a *Commixture* of somewhat that is in it selfe *Ingrate*. Certainly, we see how *Discords* in *Musicke*, falling upon *Concords*, make the *Sweetest Straines*: And wee see againe, what *Strange Tastes* delight the Taste; As *Red-Herrings*, *Caviary*, *Parmizan*, &c. And it may be, the same holdeth in *Smells*. For those kinde of *Smells*, that wee have mentioned, are all *Strong*, and doe *Pull* and *Vellicate* the *Sense*. And we finde also, that *Places* where Men *Vrine*, commonly have some *Smell* of *Violets*: And *Vrine*, if one hath eaten *Nutmeg*, hath so too.

The *Sloathfull*, *Generall*, and *Indefinite Contemplations*, and *Notions*, of the *Elements*, and their *Conjugations*; Of the *Influences* of *Heaven*; Of *Heat*, *Cold*, *Moisture*, *Drought*, *Qualities Active*, *Passive*; and the like; have swallowed up the true *Passages*, and *Processes*, and *Affects*, and *Consistences* of *Matter*, and *Naturall Bodies*. Therefore they are to bee set aside, being but *Notionall*, and *ill Limited*; And *Definite Axiomes* are to bee drawne out of *Measured Instances*: And so *Assent* to be made to the more *Generall Axiomes*, by *Scale*. And of these *Kindres* of *Processes* of *Natures*, and *Characters* of *Matter*, we will now set downe some *Instances*.

Experiment  
Solitary, touching the  
Causes of Putrefaction.

836

ALL *Putrefactions* come chiefly from the *Inward Spirits* of the *Body*; And partly also from the *Ambient Body*, be it *Aire*, *Liquour*, or whatsoever else. And this last, by two *Means*: Either by *Ingresse* of the *Substance* of the *Ambient Bodie*, into the *Body Putrified*; Or by *Excitation* and *Sollicitation* of the *Body Putrified*, and the *Parts* thereof, by the *Body Ambient*. As for the Received Opinion, that *Putrefaction* is caused, either by *Cold*, or *Peregrine* and *Preternaturall Heat*, it is but *Nugation*: For *Cold* in *Things Inanimate*, is the greatest *Enemy* that is, to *Putrefaction*; though it extinguisheth *Vivification*, which ever consisteth in *Spirits Attenuate*, which the *Cold* doth congeale, and coagulate. And as for the *Peregrine Heat*, it is thus farre true; That if the *Proportion* of the *Adventine Heat*, be greatly *Predominant*, to the *Naturall Heat* and *Spirits* of the *Body*, it tendeth to *Dissolution*, or *Notable Alteration*. But this is wrought by *Emission*, or *Suppression*, Or *Suffocation*, of the *Native Spirits*; And also by the *Disordination*, and *Discomposture* of the *Tangible Parts*; And other *Passages* of *Nature*; And not by a *Conflict* of *Heats*.

In



**I**N *Versions*, or *Maine Alterations* of *Bodies*, there is a *Medium* between the *Body*, as it is at first, and the *Body Resulting*; which *Medium* is *Corpus imperfectè Mistum*, and is *Transitory*, and not durable; As *Mists*, *Smoakes*, *Vapours*, *Chylus* in the *Stomach*, *Living Creatures* in the first *Vivification*: And the *Middle Action*, which produceth such *Imperfect Bodies*, is fitly called, (by some of the *Ancients*;) *Inquination*, or *Inconcoction*, which is a *Kinde of Putrefaction*; For the *Parts* are in *Confusion*, till they settle; one way, or other.

**T**He word *Concoction*, or *Digestion*, is chiefly taken into use from *Living Creatures*, and their *Organs*; And from thence extended to *Liquours*, and *Fruits*, &c. Therefore they speake of *Meat Concocted*; *Vrine* and *Excrements Concocted*; And the *Four Digestions*, (In the *Stomach*; In the *Liver*; In the *Arteries* and *Nerves*; And in the *Severall Parts* of the *Body*;) are likewise called *Concoctions*: And they are all made to be the *Workes of Heat*: All which *Notions* are but ignorant *Catches* of a few *Things*, which are most *Obvious to Mens Observations*. The *Constantest Notion of Concoction* is, that it should signifie the *Degrees of Alteration*, of one *Body* into another, from *Crudity* to *Perfect Concoction*; Which is the *Vlinitie* of that *Action*, or *Processe*: And while the *Body* to be *Converted* and *Altered*, is too strong for the *Efficient*, that should *Convert*, or *Alter* it, (whereby it resisteth and holdeth fast in some degree the first *Forme*, or *Consistence*;) it is (all that while,) *Crude*, and *Inconcoct*; And the *Processe* is to be called *Cruditie* and *Inconcoction*. It is true, that *Concoction* is, in great part, the *Worke of Heat*; But not the *Worke of Heat* alone: For all *Things*, that further the *Conversion*, or *Alteration*, (as *Rest*, *Mixture* of a *Body* already *Concocted*, &c.) are also *Meanes to Concoction*. And there are of *Concoction* two *Periods*; The one *Assimilation*, or *Absolute Conversion* and *Subaction*; The other *Maturation*: whereof the *Former* is most conspicuous in the *Bodies of Living Creatures*; In which there is an *Absolute Conversion*, and *Assimilation* of the *Nourishment* into the *Body*: And likewise in the *Bodies of Plants*: And againe in *Metalls*, where there is a full *Transmutation*. The other, (which is *Maturation*;) is seene in *Liquours*, and *Fruits*; wherein there is not desired, nor pretended, an utter *Conversion*, but onely an *Alteration* to that *Forme*, which is most sought, for *Mans use*; As in *Clarifying of Drinckes*; *Ripening of Fruits*, &c. But note, that there bee two *Kindes of Absolute Conversions*; The one is, when a *Body* is converted into another *Body*, which was before; As when *Nourishment* is turned into *Flesh*; That is it which we call *Assimilation*. The other is, when the *Conversion* is into a *Body* meerely *New*, and which was not before; As if *Silver* should be turned to *Gold*; or *Iron* to *Copper*: And this *Conversion* is better called, for distinction sake, *Transmutation*.

**T**Here are also divers other *Great Alterations* of *Matter*, and *Bodies*, besides those that tend to *Concoction*, and *Maturation*; For whatsoever doth so alter a *Body*, as it returneth not againe to that it was, may bee called *Alteratio Major*: As when *Meat* is *Boyled*, or *Roasted*, or *Fried*, &c. Or when *Bread* and *Meat* are *Baked*; Or when *Cheese* is made of *Curds*, or *Butter* of *Creame*, or *Coales* of *wood*, or *Bricks* of *Earth*; And a *Number* of others. But to apply *Notions Philosophicall* to *Plebeian Termes*; Or to say, where the *Notions* cannot fitly be reconciled, that there wanteth a *Terme*, or *Nomenclature* for it; (as the *Ancients* used;) They bee but *Shifts of Ignorance*; For

Knowledge

Experiment  
Solitary, touching  
Bodies  
Vnperfectly  
Mixt.

837

Experiment  
Solitary, touching  
Concoction and  
Crudity.

838

Experiment  
Solitary, touching  
Alterations, which  
may be called  
Majors.

839



Knowledge will bee ever a *wandering* and *Indigested Thing*, if it bee but a *Com-mixture* of a few *Notions*, that are at hand and occurre, and not excited from sufficient Number of *Instances*, and those well collated.

The *Consistences* of *Bodies* are very *Divers*: *Dense*, *Rare*, *Tangible*, *Pneumaticall*, *Volatile*, *Fixed*; *Determinate*, *Not Determinate*, *Hard*, *Soft*; *Cleaving*, *Not Cleaving*; *Congeleable*, *Not Congeleable*; *Liquefiable*, *Not Liquefiable*; *Fragile*, *Tough*; *Flexible*, *Inflexible*; *Tractile*, or to be drawne forth in length, *Intractile*; *Porous*, *Solide*; *Equall*, and *Smooth*, *Vnequall*; *Venous*, and *Fibrous*, and with *Graines*, *Entire*; And divers Others; All which to referre to *Heat*, and *Cold*; and *Moisture*, and *Drought* is a *Compendious* and *Inutile Speculation*. But of these see principally our *Abecedarium Naturæ*; And otherwise *Sparsim* in this our *Sylva Sylvarum*, Nevertheless in some good part, Wee shall handle divers of them now presently.

Experiment  
Solitary, touch-  
ing Bodies  
Liquefiable,  
and not Li-  
quefiable.

840

**L**iquefiable, and *Not Liquefiable*, proceed from these *Causes*: *Liquefaction* is ever caused by the *Detention* of the *Spirits*, which play within the *Body*, and *Open* it. Therefore such *Bodies*, as are more *Turgid* of *Spirit*; Or that have their *Spirits* more *Straitly Imprisoned*; Or againe that hold them *Better Pleased* and *Content*; are *Liquefiable*: for these three *Dispositions* of *Bodies*, doe arrest the *Emission* of the *Spirits*. An Example of the first two *Properties* is in *Metalls*; And of the last in *Grease*, *Pitch*, *Sulphure*, *Butter*, *Waxe*, &c. The *Disposition* not to *Liquefie* proceedeth from the *Easie Emission* of the *Spirits*, whereby the *Grosser Parts* contract; And therefore, *Bodies* *lejune* of *Spirits*; Or which part with their *Spirits* more *Willingly*; are not *Liquefiable*; As *Wood*, *Clay*, *Free-Stone*, &c. But yet, even many of those *Bodies*, that will not *Melt*, or will hardly *Melt*, will notwithstanding *Soften*; As *Iron* in the *Forge*; And a *Sticke* bathed in *Hot Ashes*, which thereby becommeth more *Flexible*. Moreover, there are some *Bodies*, which doe *Liquefie*, or dissolve by *Fire*; As *Metalls*, *Waxe*, &c. And other *Bodies*, which dissolve in *Water*; As *Salt*, *Sugar*, &c. The *Cause* of the former proceedeth from the *Dilatation* of the *Spirits* by *Heat*: The *Cause* of the Latter proceedeth from the *Opening* of the *Tangible Parts*, which desire to receive the *Liquour*. Again, there are some *Bodies*, that dissolve with both; As *Gumme*, &c. And those bee such *Bodies*, as on the One Side have good store of *Spirit*; And on the other Side, have the *Tangible Parts* *Indigent* of *Moisture*; For the former helpeth to the *Dilating* of the *Spirits* by the *Fire*; And the Latter *Stimula-teth* the *Parts* to Receive the *Liquor*.

Experiment  
Solitary, touch-  
ing Bodies  
Fragile, and  
Tough.

841

**O**F *Bodies* some are *Fragile*; And some are *Tough*, and *Not Fragile*; And in the *Breaking*, some *Fragile Bodies* break but where the *Force* is; Some shatter and flie in many *Peeces*. Of *Fragility* the *Cause* is an *Impotency* to bee *Extended*: And therefore *Stone* is more *Fragile* than *Metall*; And so *Fertile Earth* is more *Fragile* than *Crude Earth*, And *Dry Wood* than *Greene*. And the *Cause* of this *Vnaptnesse* to *Extension*, is the *Small Quantity* of *Spirits*; (For it is the *Spirit* that furthereth the *Extension* or *Dilatation* of *Bodies*;) And it is ever *Concomitant* with *Porosity*, and with *Driness* in the *Tangible Parts*:  
Contrariwise,



Contrariwise, Tough Bodies have more Spirit, and fewer Pores, and Moisture, Tangible Parts: Therefore we see that Parchment, or Leather will stretch; Paper will not; Woollen Cloth will tenter, Linnen scarcely.

**A**LL Solide Bodies consist of Parts of two severall Natures; Pneumaticall, and Tangible; And it is well to be noted, that the Pneumaticall Substance is in some Bodies, the Native Spirit of the Bodie; And in some other, plaine Aire that is gotten in; As in Bodies desiccate, by Heat, or Age: For in them, when the Native Spirit goeth forth, and the Moisture with it, the Aire with time getteth into the Pores. And those Bodies are ever the more Fragile; For the Native Spirit is more Yeelding, and Extensive, (especially to follow the Parts,) than Aire. The Native Spirits also admit great Diversitie; As Hot, Cold, Active, Dull, &c. Whence proceed most of the Vertues, and Qualities (as we call them) of Bodies: But the Aire Inermixt, is without Vertues, and maketh Things Insipide, and without any Exstimulation.

**T**HE Concretion of Bodies is (commonly) solved by the Contrary; As Ice, which is congealed by Cold, is dissolved by Heat; Salt and Sugar, which are Excocted by Heat, are Dissolved by Cold, and Moisture. The Cause is, for that these Operations, are rather Returnes to their former Nature, than Alterations: So that the Contrary cureth. As for Oyle, it doth neither easily congeale with Cold, nor thicken with Heat. The Cause of both Effects, though they be produced by Contrary Efficientes, seemeth to be the Same; And that is, because the Spirit of the Oyle, by either Meanes, exaleth little; For the Cold keepeth it in; and the Heat, (except it bee Vehement,) doth not call it forth. As for Cold, though it take hold of the Tangible Parts, yet as to the Spirits, it doth rather make them Swell, than Congeale them: As when Ice is congealed in a Cup, the Ice will Swell in stead of Contracting; And sometimes Rift.

**O**F Bodies, some (we see) are Hard, and some Soft: The Hardnesse is caused (chiefly) by the Iejunenesse of the Spirits; And their Imparity with the Tangible Parts: Both which if they be in a greater degree, maketh them not onely Hard, but Fragile, and lesse Enduring of Pressure; As Steele, Stone, Glasse, Drie Wood, &c. Softnesse commeth (contrariwise) by the Greater Quantity of Spirits; (which ever helpeth to Induce Yeelding and Cession;) And by the more Equall Spreading of the Tangible Parts, which thereby are more Sliding, and Following; As in Gold, Lead, Wax, &c. But note, that Soft Bodies, (as we use the word,) are of two Kinds; The one, that easily giveth place to another Body, but altereth not Bulke, by Rising in other Places: And therefore we see that Wax, if you put any Thing into it, doth not rise in Bulke, but onely giveth Place: For you may not thinke, that in Priming of Wax, the Wax riseth up at all; But onely the depressed Part giveth place, and the other remaineth as it was. The other that altereth Bulke in the Cession, As Water, or other Liquours, if you put a Stone, or any Thing into them, they give place (indeed) easily, but then they rise all over: Which is a False Cession; For it is in Place, and not in Body.

**A**LL Bodies Ductile, and Tensile, (as Metals that will be drawne into Wires; Wooll and Towe that will be drawne into Yarne, or Thred; have in them the Appetite of Not Discontinuing, Strong; Which maketh them follow the Force, that pulleth them out; And yet so, as not Discontinue or

Experiment  
Solitary, touching the  
Two Kinds of  
Pneumatics  
in Bodies.

842

Experiment  
Solitary, touching Concre-  
tion, and Dis-  
solution of  
Bodies.

843

Experiment  
Solitary, touch-  
ing Hard  
and Soft  
Bodies.

844

Experiment  
Solitary, touch-  
ing Bodies  
Ductile, and  
Tensile.

845



forlake their owne Body. *Viscous Bodies*, (likewise,) as *Pitch, Wax, Bird-Lime, Cheese* *toasted*, will draw forth, and roape. But the difference betweene *Bodies Fibrous*, and *Bodies Viscous*, is *Plaine*; For all *wooll*, and *Tow*, and *Cotton*, and *Silke*, (especially raw *Silke*,) have, besides their desire of *Continuance*, in regard of the *Tenuitie* of their *Thred*, a *Greedinesse* of *Moisture*; And by *Moisture* to joyne and incorporate with other *Thred*; Especially if there bee a little *Wreathing*; As appeareth by the *Twisting* of *Thred*; And the *Practice* of *Twirling* about of *spindles*. And we see also, that *Gold* and *silver Thred* cannot be made without *Twisting*.

Experiment  
Solitary, touch-  
ing other  
Passions of  
Matter, and  
Characters of  
Bodies.

846

**T**HE Differences of *Impresible* and *Not Impresible*, *Figurable*, and *not Figurable*, *Mouldable*, and *Not Mouldable*, *Scissible* and *Not Scissible*, and many other *Passions* of *Matter*, are *Plebeian Notions*, applied unto the *Instruments* and *Vses* which Men ordinarily practise; But they are all but the *Effects* of some of these *Causes* following; Which we will *Enumerate* without *Applying* them, because that would bee too long. The First is the *Cession*, or *Not Cession* of *Bodies*, into a *Smaller Space* or *Roome*, keeping the *Outward Bulke*, and not flying up. The Second is the *Stronger* or *Weaker Appetite*, in *Bodies*, to *Continuitie*, and to flie *Discontinuitie*. The Third is the *Disposition* of *Bodies*, to *Contract*, or *Not Contract*; And againe, to *Extend*, or *Not Extend*. The Fourth is the *Small Quantity*, or *Great Quantity*, of the *Pneumaticall* in *Bodies*. The Fifth is the *Nature* of the *Pneumaticall*, whether it bee *Native Spirit* of the *Body*, or *Common Aire*. The Sixth is, the *Nature* of the *Native Spirits* in the *Body*, whether they be *Active* and *Eager*, or *Dull* and *Gentle*. The Seventh is the *Emission* or *Detention* of the *Spirits* in *Bodies*. The Eighth is the *Dilatation*, or *Contraction* of the *Spirits* in *Bodies*, while they are detained. The Ninth is the *Collocation* of the *Spirits* in *Bodies*; whether the *Collocation* be *Equall*, or *Vnequall*; And againe, whether the *Spirits* be *Coacervate*, or *Diffused*. The Tenth is the *Densitie*, or *Rarity* of the *Tangible Parts*. The Eleventh is the *Equalitie* or *Inequality* of the *Tangible Parts*. The Twelfth is the *Digestion*, or *Cruditie* of the *Tangible Parts*. The Thirteenth is the *Nature* of the *Matter*, whether *Sulphureous*, or *Mercuriall*, *warrie* or *Oillie*, *Drie* and *Terrestriall*, or *Moist* and *Liquid*; which *Natures* of *Sulphureous* and *Mercuriall*, seeme to be *Natures Radicall*, and *Principall*. The Fourteenth is the *Placing* of the *Tangible Parts*, in *Length* or *Transverse*; (As it is in the *Warp*, and the *woofe*, of *Textiles*; ) *More Inward*, or *More Outward*, &c. The Fifteenth is the *Porositie*, or *Imporosity* betwixt the *Tangible Parts*; And the *Greatnesse*, or *Smallnesse* of the *Pores*. The Sixteenth is the *Collocation* and *Posture* of the *Pores*. There may be more *Causes*; But these doe occure for the *Present*.

Experiment  
Solitary, touch-  
ing *Induration*  
by *Sympathy*.

847

**T**AKE *Lead*, and melt it, and in the *Middest* of it, when it beginneth to *Congeale*, make a little *Diut*, or *Hole*, and put *Quick-Silver* wrapped in a *Pece* of *Linne* into that *Hole*, and the *Quick-Silver* will fix, and runne no more, and endure the *Hammer*. This is a *Noble Instance* of *Induration*, by *Consent* of one *Body* with another, and *Motion* of *Excitation* to *Irritate*; For to ascribe it onely to the *Vapour* of *Lead*, is lesse *Probable*. *Quere* whether the *Fixing* may be in such a degree, as it will be *Figured* like other *Metalls*? For if so, you may make *Workes* of it for some purposes, so they come not neare the *Fire*.

Sugar



**S**ugar hath put downe the use of *Honey*; Inſomuch as we have loſt thoſe *Observations*, and *Preparations* of *Honey*, which the *Ancients* had, when it was more in Price. Firſt, it ſeemeth that there was, in old time, *Tree-Honey*, as well as *Bee-Honey*; Which was the *Teare* or *Bloud* iſſuing from the *Tree*: Inſomuch as one of the *Ancients* relateth, that in *Trebisond*, there was *Honey* iſſuing from the *Box-Trees*, which made *Men* Mad. Againē, in *Ancient* time, there was a Kinde of *Honey*, which either of the owne Nature, or by Art, would grow as Hard as *Sugar*; And was not ſo Luſhious as *Ours*. They had alſo a *Wine* of *Honey*, which they made thus. They cruſhed the *Honey* into a great *Quantity* of *Water*, and then ſtrained the *Liquour*; After they boyled it in a *Copper* to the halfe: Then they powred it into *Earthen Veſſels*, for a ſmall time; And after turned it into *Veſſels* of *Wood*, and kept it for many yeares. They have alſo, at this day, in *Ruſſia*, and thoſe *Northerne Countries*, *Mead Simple*, which (wellmade, and ſeaſoned) is a good wholeſome *Drinke*, and very Cleare. They uſe alſo in *Wales*, a *Compound Drinke* of *Mead*, with *Herbr*, and *Spices*. But meane-while it were good, in recompence of that we have loſt in *Honey*, there were brought in uſe a *Sugar-Mead*, (for ſo we may call it,) though without any *Mixture* at all of *Honey*; And to brew it, and keep it ſtale, as they uſe *Mead*; For certainly, though it would not be ſo *Abſterſive*, and *Opening*, and *Solutive* a *Drinke* as *Mead*; yet it will be more gratefull to the *Stomach*, and more *Lenitive*, and fit to bee uſed in *Sharp Diſeaſes*: For we ſee, that the uſe of *Sugar* in *Beere*, and *Ale*, hath good *Effects* in ſuch *Caſes*.

**I**t is reported by the *Ancients*, that there was a Kinde of *Steele*, in ſome places, which would poliſh almoſt as white and bright as *Silver*. And that there was in *India* a Kinde of *Brasse*, which (being poliſhed) could ſcarce be diſcerned from *Gold*. This was in the *Naturall Vre*; but I am doubtfull, whether *Men* have ſufficiently refined *Metals*, which wee count *Base*; As whether *Iron*, *Brasse*, and *Tinne*, be refined to the Heighth? But when they come to ſuch a Fineneſſe, as ſerveth the ordinary uſe, they trie no further.

**T**here have been found certaine *Cements* under *Earth*, that are very Soft; And yet, taken forth into the *ſunne*, harden as Hard as *Mar'le*: There are alſo ordinary *Quarries* in *Summerſet-Shire*, which in the *Quarry* cut ſoft to any bigneſſe, and in the *Building* prove firme, and hard.

**L**iving *Creatures* (generally) doe change their *Haire* with *Age*, turning to be *Gray*, and *White*: As is ſcene in *Men*, though ſome Earlier, ſome Later; In *Horſes*, that are Dappled, and turne *White*; In *Old Squirrels*, that turne *Grifly*; And many Others. So doe ſome *Birds*; As *Cygnets*, from *Gray* turne *White*; *Hawkes* from *Browne* turne more *White*: And ſome *Birds* there be, that upon their *Mouling*, doe turne Colour; As *Robin-Red-breſts*, after their *Mouling* grow to be *Red* againe, by degrees; So doe *Gold-Finches* upon the *Head*. The *Cauſe* is, for that *Moſture* doth (chiefly) colour *Haire*, and *Feathers*; And *Drienneſſe* turneth them *Gray* and *White*; Now *Haire* in *Age* waxeth *Drier*: So doe *Feathers*. As for *Feathers*, after *Mouling*, they are *Young Feathers*, and ſo all one as the *Feathers* of *Young Birds*. So the *Beard* is younger than the *Haire* of the *Head*, and doth (for the moſt part,) wax *Hoare* later. Out of this Ground, a *Man* may deviſe the *Means* of *Altering* the Colour of *Birds*, and the *Retardation* of *Hoare-Haires*. But of this ſee the fifth Experiment.

Experiment  
Solitary, tou-  
ching *Honey*  
and *Sugar*.

848

Experiment  
Solitary, tou-  
ching the  
Finer Sort of  
Base Metals.

849

Experiment  
Solitary, tou-  
ching *Cements*  
and *Quarries*.

850

Experiment  
Solitary, tou-  
ching the  
Altering of  
the Colour of  
*Haires* and  
*Feathers*.

851



Experiment  
Solitary, touch-  
ing the Dif-  
ferences of Li-  
ving Crea-  
tures, Male  
and Female.

852

**T**He Difference betweene Male and Female, in some Creatures, is not to be discerned, otherwise than in the Parts of Generation: As in Horses and Mares, Dogs, and Bitches, Doves He and Shee, and others. But some differ in Magnitude, and that diversly; For in most the Male is the greater; As in Man, Pheasants, Peacocks, Turkey's; and the like: And in some few, as in Hawkes, the Female. Some differ in the Haire, and Feathers, both in the Quantity, Crispation, and Colours of them; As He-Lions, are Hirsute, and have great Maines; The She's are smooth like Cats. Bulls are more Crispe upon the Fore-Head than Comes; The Peacock, and Pheasant-Cock, and Gold-Finch-Cock, have glorious and fine Colours; The Henn's have not. Generally, the Hees in Birds have the fairest Feathers. Some differ in divers Features; As Bucks have Hornes, Doe's none; Rammes have more wreathed Hornes than Ewes; Cocks have great Combes and Spurres. Hennes little or none; Boares have great Fangs, Sows much lesse; The Turkey-Cocke hath great and Swelling Gills, the Henne hath lesse; Men have generally Deeper and Stronger Voices than Women. Some differ in Facultie; As the Cocks amongst Singing Birds, are the best Singers. The Chiefe Cause of all these, (no doubt,) is, for that the Males have more Strength of Heat than the Females; Which appeareth manifestly in this, that all young Creatures Males, are like Females; And so are Eunuchs, and Geli Creatures of all kindes, liker Females. Now Heat causeth Greatnesse of Growth, generally, where there is Moisture enough to worke upon: But if there be found in any Creature, (which is seene rarely,) an Over-great Heat in proportion to the Moisture, in them the Female is the greater; As in Hawkes, and Sparrowes. And if the Heat be ballanced with the Moisture, then there is no Difference to be seene betweene Male and Female: As in the Instances of Horses, and Dogs. We see also, that the Hornes of Oxen, and Comes, for the most part, are Larger than the Bulls; which is caused by abundance of Moisture, which in the Hornes of the Bull faileth. Againe, Heat causeth Pilositie, and Crispation; And so likewise Beards in Men. It also expelleth finer Moisture, which want of Heat cannot Expell; And that is the Cause of the Beautie and Varieie of Feathers: Againe, Heat doth put forth many Excrecences, and much Solide Matter, which Want of Heat cannot doe: And this is the Cause of Hornes, and of the Greatnesse of them; And of the Greatnesse of the Combs & Spurres of Cocks, Gills of Turkey-Cocks, and Fangs of Boares. Heat also dilateth the Pipes, and Organs, which causeth the Deepnesse of the Voice. Againe, Heat refineth the Spirits, and that causeth the Cock-Singing Bird, to Excell the Hen.

Experiment  
Solitary, touch-  
ing the  
Comparative  
Magnitude  
of Living  
Creatures.

853

**T**Here be Fishes greater than any Beasts; As the Whale is farre greater than the Elephant. And Beasts are (generally) greater than Birds. For Fishes, the Cause may be, that because they Live not in the Aire, they have not their Moisture drawne and Soaked by the Aire, and Sunne-Beames. Also the rest alwayes in a manner, and are supported by the Water; whereas Motion and Labour do consume. As for the Greatnesse of Beasts, more than of Birds, it is caused, for that Beasts stay Longer time in the womb, than Birds, and there Nourish, and grow; Whereas in Birds, after the Egge Lay'd, there is no further Growth, or Nourishment from the Female: For the Sitting doth Vivifie, and not Nourish.

Experiment  
Solitary, touch-  
ing Exos-  
sation of Fruits.

854

**W**e have partly touched before the Meanes of Producing Fruits, without Coares, or Stones. And this we adde further, that the Cause must be Abundance of Moisture; For that the Coare, and Stone are made of a Drie

Sap:



*Sap*: And we see, that it is possible, to make a *Tree* put forth onely in *Blos-*  
some, without *Fruit*; As in *Cherries* with *Double Flowers*; Much more in  
*Fruit* without *Stone*, or *Coares*. It is reported, that a *Cions* of an *Apple*, grafted  
upon a *Colewort-Stalke*, sendeth forth a great *Apple* without a *Coare*. It is not  
unlikely, that if the *Inward Pith* of a *Tree*, were taken out, so that the *Juyce*  
came onely by the *Barke*, it would worke the *Effect*. For it hath beene obser-  
ved, that in *Pollards*, if the *Water* get in on the *Top*, and they become *Hol-*  
low, they put forth the more. We adde also, that it is delivered for certaine  
by some, that if the *Cions* be grafted, the *Small End* downwards, it will  
make *Fruit* have little or no *Coares*, and *Stones*.

**T**obacco is a thing of great Price, if it be in request. For an *Acre* of it  
will be worth, (as is affirmed,) two Hundred Pounds, by the yeare, to-  
wards Charge. The Charge of making the Ground, and otherwise, is great,  
but nothing to the Profit. But the *English Tobacco*, hath small credit, as be-  
ing too *Dull*, and *Earthy*: Nay the *Virginian Tobacco*, though that bee in a  
*Hotter Climate*, can get no credit, for the same Cause: So that a *Triall* to make  
*Tobacco* more *Aromaticall*, and better *Concocted* here in *England*, were a  
Thing of great profit. Some have gone about to doe it by *Drenching* the  
*English Tobacco*, in a *Decoction* or *Infusion* of *Indian Tobacco*: But those are  
but *Sophistications*, and *Toyes*; For Nothing that is once *Perfect*, and  
hath runne his Race, can receive much *Amendment*. You must ever resort  
to the *Beginnings* of Things for *Melioration*. The *Way* of *Maturation* of  
*Tobacco* must, as in other *Plants*, be, from the *Heat*, Either of the *Earth*, or of  
the *Sunne*: We see some *Leading* of this in *Musk-Melons*; which are sow-  
en upon a *Hot Bed*, Dugged below, upon a *Banke* turned upon the *South*  
*Sunne*, to give *Heat* by *Reflexion*; Laid upon *Tiles*, which increaseth the  
*Heat*; And Covered with *Straw* to keepe them from *Cold*. They remove  
them also, which addeth some *Life*: And by these *Helps* they become as  
good in *England*, as in *Italy*, or *Provence*. These, and the like *Meanes*, may  
be tried in *Tobacco*. Enquire also of the *Steeping* of *Roots*, in some such *Li-*  
*quour*, as may give them *Vigour* to put forth *Strong*.

**H**eat of the *Sunne*, for the *Maturation* of *Fruits*; Yea and the *Heat* of *Vi-*  
*vification* of *Living Creatures*; are both represented and supplied, by  
the *Heat* of *Fire*; And likewise, the *Heats* of the *Sunne*, and *Life*, are repre-  
sented one by the other. *Trees*, set upon the *Backs* of *Chimneyes*, doe ripen  
*Fruit* sooner. *Vines*, that have beene drawne in at the *Window* of a *Kitchen*,  
have sent forth *Grapes* ripe a *Moneth* (at least) before others. *Stoves*, at the  
*Backe* of *Walls*, bring forth *Orenge*s herewith us. *Egges*, as is reported by  
some, have beene hatched in the warmth of an *Oven*. It is reported by  
the *Ancients*, that the *Estrich* Layeth her *Egges* under *Sand*, where the *Heat*  
of the *Sunne* discloseth them.

**B**arley in the *Boyling* swelleth not much; *Wheat* swelleth more; *Rize* ex-  
tremely; In so much as a *Quarter* of a *Pint* (unboyled) will arise to a  
*Pint* boyled. The Cause (no doubt) is, for that the more *Close* and *Compact*  
the *Body* is, the more it will dilate: Now *Barley* is the most *Hollow*; *Wheat*  
more *Solide* than that; and *Rize* most *Solide* of all. It may bee also that  
some *Bodies* have a *Kinde* of *Lentour*, and more *Depertible Nature* than  
others; As we see it Evident in *Colouration*; For a *Small Quantity* of *Saf-*  
*fron*, will *Tinct* more, than a very great *Quantity* of *Bresill*, or *Wine*.

Experiment  
Solitary, tou-  
ching the  
Melioration of  
Tobacco.

855

Experiment  
Solitary, tou-  
ching severall  
Heats, work-  
ing the same  
Effects.

856

Experiment  
Solitary, tou-  
ching Swelling  
and Dilation  
in Boyling.

857



Experiment  
Solitary, tou-  
ching the  
Dulcoration of  
Fruits.

858

**F**ruit groweth Sweet by Rowling, or Pressing them gently with the Hand; As Rowling Peares, Damascins, &c. By Rotiennesse; As Medlars, Services, Sloe's, Heps, &c. By Time; As Apples, Wardens, Pomegranats, &c. By certaine Speciall Maturation; As by Laying them in Hay, Straw, &c. And by Fire; As in Roasting, Stewing, Baking, &c. The Cause of the Sweetnesse by Rowling, and Pressing, is Emolliation, which they properly enduce; As in Beating of Stock-Fish, Flesh, &c. By Rotiennesse is, for that the Spirit of the Fruit, by Putrefaction, gather Heat, and thereby digest the Harder Part: For in all Putrefactions, there is a Degree of Heat. By Time and Keeping is, because the Spirit of the Body, doe ever feed upon the Tangible Parts, and attenuate them: By Severall Maturation is, by some Degree of Heat. And by Fire is, because it is the Proper Worke of Heat to Refine, and to Incorporate; And all Sourenesse consisteth in some Grossnesse of the Body: And all Incorporation doth make the Mixture of the Body, more Equall, in all the Parts; Which ever induceth a Milder Taste.

Experiment  
Solitary, tou-  
ching Flesh  
Edible, and  
not Edible.

859

**O**F Fleshes, some are Edible; Some, except it bee in Famine, not. For those that are not Edible, the Cause is, for that they have (commonly) too much Bitternesse of Taste; And therefore those Creatures, which are Fierce and Cholerick, are not Edible; As Lions, Wolves, Squirrels, Dogs, Foxes, Horses, &c. As for Kine, Sheepes, Goats, Deere, Swine, Conneyes, Hares, &c. We see they are Milde, and Fearfull. Yet it is true, that Horses, which are Beasts of Courage, have beene, and are eaten by some Nations; As the Scythians were called Hippophagi; And the Chineses eat Horse-flesh at this day; And some Gluttons have used to have Colts-flesh baked. In Birds, such as are Carnivore, and Birds of Prey, are commonly no Good Meat; But the Reason is, rather the Cholerick Nature of those Birds, than their Feeding upon Flesh; For Puits, Gulls, Shovelers, Ducks, doe feed upon Flesh, and yet are good Meat: And wee see, that those Birds, which are of Prey, or feed upon Flesh, are good Meat, when they are very Young; As Hanks, Rookes out of the Nest, Owles, &c. Mans Flesh is not Eaten. The Reasons are Three: First, because Men in Humanity doe abhorre it: Secondly, because no Living Creature, that Dyeth of it selfe, is good to Eat: And therefore the Canniballs (themselves) eat no Mans-Flesh, of those that Die of Themselves, but of such as are Slaine. The Third is, because there must be (generally) some Disparity, betweene the Nourishment, and the Body Nourished; And they must not be Over-neare, or like: yet we see, that in great Weaknesse, and Consumptions, Men have beene sustained with Womans Milke: And Ficinus fondly (as I conceive) adviseth, for the Prolongation of Life, that a Veine bee opened in the Arme of some wholesome Young Man; And the Blood to be sucked. It is said, that Witches doe greedily eat Mans Flesh; which if it be true, besides a Devillish Appetite in them, it is likely to proceed, for that Mans flesh may send up High and Pleasing Vapours, which may stire the Imagination; And Witches Felicitie is chiefly in Imagination, as hath beene said!

Experiment  
Solitary, tou-  
ching the  
Salamander.

860

**T**Here is an Ancient Received Tradition of the Salamander, that it liveth in the Fire, and hath force also to extinguish the Fire. It must have two Things, if it be true, to this Operation: The One a very Close Skin, whereby Flame, which in the Midst is not so hot, cannot enter: For wee see that if the Palme of the Hand bee annointed thicke with white of Egge, and then



then *Aquavive* bee poured upon it, and *Exflamed*, yet one may endure the *Flame* a pretty while. The other is some *Excreme Cold* and *Quenching* vertue, in the *Body* of that *Creature*, which choaketh the *Fire*. Wee see that *Milke* quencheth *Wilde-Fire*, better than *Water*, because it entreth better.

**T**ime doth change *Fruit*, (as *Apples*, *Peares*, *Pomegranats*, &c.) from more *Soure*, to more *Sweet*: But contrariwise *Liquours* (even those that are of the *Juyce* of *Fruit*;) from more *Sweet* to more *Soure*; As *Wori*, *Must*, *New Verjuice*, &c. The *Cause* is, the *Congregation* of the *Spirits* together: For in both *Kindes*, the *Spirit* is attenuated by *Time*; But in the first *Kinde*, it is more *Diffused*, and more mastered by the *Grosser Parts*, which the *Spirits* doe but digest: But in *Drinkes* the *Spirits* doe reigne, and finding lesse *Opposition* of the *Parts*, become themselves more *Strong*; Which causeth also more *Strength* in the *Liquour*; Such, as if the *Spirits* be of the *Hotter Sort*, the *Liquour* becommeth apt to *Burne*; But in *Time*, it causeth likewise, when the *Higher Spirits* are *Evapourated*, more *Sourenesse*.

**I**T hath beene observed by the *Ancients*, that *Plates* of *Metall*, and especially of *Brasse*, applied presently to a *Blow*, will keepe it downe from *Swelling*. The *Cause* is *Repercussion*, without *Humedation*, or *Entrance* of any *Body*: for the *Plate* hath onely a *Virtuall Cold*, which doth not search into the *Hurt*; Whereas all *Plasters* and *Oyntments* doe enter. Surely, the *Cause*, that *Blowes* and *Bruises* induce *Swellings*, is, for that the *Spirits* resorting to *Succour* the *Part* that *Laboureth*, draw also the *Humours* with them: For we see, that it is not the *Repulse*, and the *Returne* of the *Humour* in the *Part Strucken*, that causeth it; For that *Gouts*, and *Tooth-Aches* cause *Swelling*, where there is no *Percussion* at all.

**T**he *Nature* of the *Orris Root*, is almost *Singular*; For there be few *Odo-riferous Roots*; And in those that are, in any degree, *Sweet*, it is but the same *Sweetnesse* with the *Wood*, or *Leafe*: but the *Orris* is not *Sweet* in the *Leafe*; Neither is the *Flower* any thing so *Sweet* as the *Root*. The *Root* seemeth to have a *Tender dainty Heat*, which when it commeth above *Ground*, to the *Sunne*, and the *Aire*, vanisheth: For it is a great *Mollifier*; And hath a *Smell* like a *Violet*.

**I**T hath beene observed by the *Ancients*, that a great *Vessell* full, drawne into *Bottles*; And then the *Liquour* put againe into the *Vessell*, will not fill the *Vessell* again, so full as it was, but that it may take in more *Liquour*: And that this holdeth more in *Wine*, than in *Water*. The *Cause* may bee *Triviall*; Namely, by the *Expence* of the *Liquour*, in regard some may stick to the *Sides* of the *Bottles*: But there may bee a *Cause* more *Subtill*; Which is, that the *Liquour* in the *Vessell*, is not so much *Compressed*, as in the *Bottle*; Because in the *Vessell*, the *Liquour* meeteth with *Liquour* chiefly, But in the *Bottles* a *Small Quantity* of *Liquour*, meeteth with the *Sides* of the *Bottles*, which *Compresse* it so, that it doth not *Open* againe.

**W**ater, being contiguous with *Aire*, *Coolerh* it, but *Moisteneth* it not, except it *Vapour*. The *Cause* is, for that *Heat* and *Cold* have a *Virtuall Transition*, without *Communication* of *Substance*; but *Moisture* not: And to all *Madefaction* there is required an *Imbibition*: But where the *Bodies* are of such severall *Levirie*, and *Gravity*, as they *Mingle* not, they can follow

Experiment  
Solitary, tou-  
ching the  
Contray Op-  
erations of  
Time, upon  
Fruits, and  
Liquours.

861

Experiment  
Solitary, tou-  
ching Blowes  
and Bruises.

862

Experiment  
Solitary, tou-  
ching the  
Orris Root.

863

Experiment  
Solitary, tou-  
ching the  
Compression of  
Liquours.

864

Experiment  
Solitary, tou-  
ching the  
working of  
water upon  
Aire Contign-  
ons.

865

no



no Imbibition. And therefore, Oyle likewise lyeth at the Top of the Water, without Commixture: And a Drop of Water, running swiftly over a Straw, or Smooth Body, wettereth not.

Experiment  
Solitary, touch-  
ing the  
Nature of  
Aire.

866

**S**tarre-Light Nights, yea and bright Moone-shine Nights, are Colder than Cloudy Nights. The Cause is, the Driness and Finenesse of the Aire, which thereby becommeth more Piercing, and Sharpe: And therefore Great Continents are colder than Islands: And as for the Moone, though it selfe inclineth the Aire to Moisture, yet when it shineth bright, it argueth the Aire is drie. Also Close Aire is warmer than Open Aire; which (it may bee) is, for that the true Cause of Cold, is an Expiration from the Globe of the Earth, which in open Places is stronger; And againe, Aire it selfe, if it be not altered by that Expiration, is not without some Secret Degree of Heat: As it is not likewise without some Secret Degree of Light: For otherwise Cats, and Owles, could not see in the Night; But that Aire hath a little Light, Proportionable to the Visuall Spirits of those Creatures.

Experiments  
in Consort,  
touching the  
Eyes, and  
Sight.

867

**T**He Eyes doe move one and the same way; For when one Eye moveth to the Nostrill, the other moveth from the Nostrill. The Cause is Motion of Consent, which in the Spirits, and Parts Spirituall, is Strong. But yet Use will induce the Contrary: For some can Squint, when they will: And the Common Tradition is, that if Children, be set upon a Table, with a Candle behinde them, both Eyes will move Outwards; As affecting to see the Light, and so induce Squinting.

868

We see more exquisitely with One Eye Shut, than with Both Open. The Cause is, for that the Spirits Visuall unite themselves more, and so become Stronger. For you may see, by looking in a Glasse, that when you shut one Eye, the Pupill of the other Eye, that is Open, Dilateth.

869

The Eyes, if the Sight meet not in one Angle, See Things Double. The Cause is, for that Seeing two Things, and Seeing one Thing twice, worketh the same Effect: And therefore a little Pellet, held betweene two Fingers, laid a crosse, seemeth Double.

870

Pore-Blinde Men, see best in the Dimmer Light; And likewise have their Sight Stronger neere hand, than those that are not Pore-blinde; And can Reade and Write smaller Letters. The Cause is, for that the Spirits Visuall, in those that are Pore-blinde, are Thinner, and Rarer, than in others; And therefore the Greater Light disperseth them. For the same Cause they need Contracting; But being Contracted, are more strong, than the Visuall Spirits of Ordinary Eyes are; As when we see thorow a Levell, the Sight is the Stronger: And so is it, when you gather the Eye-lids somewhat close: And it is commonly scene in those that are Pore-blinde, that they doe much gather the Eye-lids together. But Old Men, when they would see to Read, put the Paper somewhat a farre off. The Cause is, for that Old Mens Spirits Visuall, contrary to those of Pore-blinde Men, unite not, but when the Object is at some good distance, from their Eyes.

871

Men see better, when their Eyes are over-against the Sunne, or a Candle, if they put their Hand a little before their Eye. The Reason is, for that the Glaring of the Sunne, or the Candle, doth weaken the Eye; whereas the Light Circumsused is enough for the Perception. For we see, that an Over-light maketh the Eyes Dazell; Insomuch as Perpetuall Looking against the Sunne, would Cause Blindnesse. Again, if Men come out of a Great Light, into a Darke Roome; And contrariwise, if they come out of a Darke Roome, into a

Light



*Light Roome*, they seeme to have a *Mist* before their *Eyes*, and see worse than they shall doe, after they have stayed a little while, either in the *Light*, or in the *Darke*. The *Cause* is, for that the *Spirits Visuall*, are upon a sudden Change, disturbed, and put out of Order; And till they be recollected, doe not performe their Function well. For when they are much *Dilated* by *Light*, they cannot *Contract* suddenly; And when they are much *Contracted* by *Darknesse*, they cannot *Dilate* suddenly. And Excesse of both these, (that is, of the *Dilatation*, and *Contraction* of the *Spirits Visuall*,) if it be long, Destroyeth the *Eye*. For as long looking against the *Sunne*, or *Fire* hurteth the *Eye* by *Dilatation*; So *Curious Paining* in *Small Volumes*, and *Reading* of *Small Letters*, doe hurt the *Eye* by *Contraction*.

It hath beene observed, that in *Anger*, the *Eyes* wax *Red*; And in *Blushing*, not the *Eyes*, but the *Eares*, and the *Parts* behinde them. The *Cause* is, for that in *Anger*, the *Spirits* ascend and wax *Eager*; Which is most easily seen in the *Eyes*, because they are *Translucide*; Though withall it maketh both the *Cheekes* and the *Gills* *Red*; But in *Blushing*, it is true, the *Spirits* ascend likewise to *Succour*, both the *Eyes*, and the *Face*, which are the *Parts* that labour: But then they are repulsed by the *Eyes*, for that the *Eyes*, in *Shame* doe put back the *Spirits*, that ascend to them, as unwilling to looke abroad: For no *Man*, in that *Passion*, doth looke strongly, but *Dejectedly*; And that *Repulsion* from the *Eyes*, *Diverteth* the *Spirits* and *Heat* more to the *Eares*, and the *Parts* by them.

The *Objects* of the *Sight*, may cause a great *Pleasure* and *Delight* in the *Spirits*, but no *Paine*, or great *Offence*; Except it be by *Memory*, as hath been said. The *Glimpses* and *Beames* of *Diamonds* that strike the *Eye*; *Indian Feathers*, that have glorious *Colours*; The *Comming* into a *Faire Garden*; The *Comming* into a *Faire Roome* richly furnished; A *Beautifull Person*; And the like, doe delight and exhilarate the *Spirits* much. The *Reason*, why it holdeth not in the *Offence*, is, for that the *Sight* is most *Spiritual* of the *Senses*; whereby it hath no *Object* *Grosse* enough to offend it. But the *Cause* (chiefly) is, for that there bee no *Active Objects* to offend the *Eye*. For *Harmonicall Sounds*, and *Discordant Sounds*, are both *Active*, and *Positive*: So are *Sweet Smells*, and *Stinks*: So are *Bitter*, and *Sweet*, in *Tastes*: So are *Over-Hot*, and *Over-Cold*, in *Touch*: But *Blacknesse*, and *Darknesse*, are indeed but *Privatives*; And therefore have little or no *Activity*. Somewhat they doe *Contristate*, but very little.

**W**ater of the *Sea*, or otherwise, looketh *Blacker* when it is moved, and *whiter* when it resteth. The *Cause* is, for that by means of the *Motion*, the *Beames* of light passe not *Straight*, and therefore must be darkened; whereas, when it resteth, the *Beames* doe passe *Straight*. Besides, *Splendour* hath a *Degree* of *Whitenesse*; Especially if there be a little *Repercussion*: For a *Looking-Glasse* with the *Steele* behinde, looketh *whiter*, than *Glasse Simple*. This *Experiment* deserveth to be driven further, in *Trying* by what *Meanes Motion* may hinder *Sight*.

**S**hell-Fish have beene, by some of the *Anciens*, compared and sorted with the *Insecta*; But I see no reason why they should; For they have *Male*, and *Female*, as other *Fish* have: Neither are they bred of *Putrefaction*; Especially such as doe *Move*. Nevertheless it is certaine, that *Oysters*, and *Cockles*, and *Muscles*, which *Move* not, have not *discriminate Sex*. *Quare* in what time, and how they are bred? It seemeth that *Shells* of *Oysters* are bred where

none

872

873

Experiment  
Solitary, touching the  
Colour of the  
Sea, or other  
water.

874

Experiment  
Solitary, touching  
Shell-  
Fish.

875



none were before; And it is tried, that the great *Horse-Muscle*, with the fine shell, that breedeth in *Ponds*, hath bred within thirty yeares: But then, which is strange, it hath been tried, that they doe not onely Gape and Shut, as the *Oysters* doe, but Remove from one Place to Another.

Experiment  
Solitary, touch-  
ing the  
*Right Side*,  
and the *Left*.

876

**T**he *Senses* are alike Strong, both on the *Right Side*, and on the *Left*; But the *Limmes* on the *Right Side* are Stronger. The Cause may be, for that the *Braine* which is the *Instrument* of *Sense*, is alike on both *Sides*; But *Motion*, and *Habillities* of *Moving*, are somewhat holpen from the *Liver*, which lieth on the *Right Side*. It may bee also, for that the *Senses* are put in *Exercise*, indifferently, on both *Sides* from the Time of our Birth; But the *Limmes* are used most on the *Right Side*, whereby *Custom* helpeth; For wee see, that some are *Left Handed*: Which are such as have used the *Left-Hand* most.

Experiment  
Solitary, touch-  
ing *Frictions*.

877

**F**rictions make the *Parts* more *Fleshie*, and *Full*: As we see both in *Men*; And in the *Currying* of *Horses*, &c. The Cause is, for that they draw greater *Quantities* of *Spirits* and *Bloud* to the *Parts*: And again, because they draw the *Aliment* more forcibly from within: And again, because they relax the *Pores*, and so make better *Passage* for the *Spirits*, *Bloud*, and *Aliment*: Lastly, because they dissipate, and digest any *Inuite* or *Excrementitious Moisture*, which lieth in the *Flesh*: All which help *Assimilation*. *Frictions* also doe more *Fill*, and *Impinguate* the *Body*, than *Exercise*. The Cause is, for that in *Frictions*, the *Inward Parts* are at rest; Which in *Exercise* are beaten (many times) too much: And for the same Reason, (as we have noted heretofore,) *Gally Slaves* are *Fat* and *Fleshie*, because they stirre the *Limmes* more, and the *Inward Parts* lesse.

Experiment  
Solitary, touch-  
ing *Globes*  
appearing  
Flat at *Dis-  
tance*.

878

**A**LL *Globes* a farre off appeare *Flat*. The Cause is, for that *Distance*, being a *Secondary Object* of *Sight*, is not otherwise discerned, than by more or lesse *Light*; which *Disparity* when it cannot bee discerned, all seemeth *One*: As it is (generally) in *Objects* not distinctly discerned; For so *Letters*, if they be so farre off, as they cannot be discerned, shew but as a *Dusky Paper*: And all *Engravings*, and *Embossings*, (a farre off) appear *Plaine*.

Experiment  
Solitary, touch-  
ing *Shad-  
owes*.

879

**T**he *Vitermost Parts* of *Shadows* seeme ever to *Tremble*. The Cause is, for that the little *Moats*, which we see in the *Sunne*, doe ever Stirre, though there be no *Wind*; And therefore those *Moving*, in the Meeting of the *Light* and the *Shadow*, from the *Light* to the *Shadow*, and from the *Shadow* to the *Light*, doe shew the *Shadow* to *Move*, because the *Medium* Moveth.

Experiment  
Solitary, touch-  
ing the  
*Rowling* and  
*Breaking* of  
the *Seas*.

880

**S**hallow, and *Narrow Seas*, breake more than *Deepe*, and *Large*. The Cause is, for that the *Impulsion* being the same in Both; Where there is greater *Quantity* of *Water*, and likewise *Space* Enough; there the *Water* Rowleth, and Moveth, both more Slowly, and with a Sloper Rise, and Fall: But where there is lesse *Water*, and lesse *Space*, and the *Water* dasheth more against the bottome; there it moveth more Swiftly, and more in *Precipice*; For in the *Breaking* of the *Waves* there is ever a *Precipice*.

Experiment  
Solitary, touch-  
ing the  
*Dulcoration* of  
*Salt-water*.

881

**I**t hath beene observed by the *Antients*, that *Salt-water* *Boyled*, or *Boyled* *Land-Cooled* againe, is more *Pleasant*, than of it selfe *Raw*: And yet the *Taste* of *Salt*, in *Distillations* by *Fire*, riseth not; For the *Distilled water* will bee *Fresh*.



*Fresh.* The Cause may be, for that the *Salt Part* of the *Water*, doth partly rise into a *Kinde* of *Scumme* on the *Top*; And partly goeth into a *Sediment* in the *Bottom*: And so is rather a *Separation*, than an *Evaporation*. But it is too grosse to rise into a *Vapour*: And so is a *Bitter Taste* likewise; For *Simple Distilled Waters*, of *Wormewood*, and the like, are not *Bitter*.

It hath beene set downe before, that *Pits* upon the *Sea-Shore*, turne into *Fresh Water*, by *Percolation* of the *Salt* through the *Sand*: But it is further noted, by some of the *Ancients*, that in some *Places* of *Affricke*, after a time, the *Water* in such *Pits* will become *Brackish* againe. The Cause is, for that after a time, the very *Sands*, thorow which the *Salt-Water* passeth, become *Salt*; And so the *strainer* it selfe is tinted with *Salt*. The Remedie therefore is, to digge still *New Pits*, when the old wax *Brackish*; as if you would change your *Strainer*.

It hath beene observed by the *Ancients*, that *Salt-Water*, will dissolve *Salt* put into it, in lesse time, than *Fresh Water* will dissolve it. The Cause may be, for that the *Salt* in the *Precedent Water*, doth, by *Similitude* of *Substance*, draw the *Salt* new put in, unto it; Whereby it diffuseth in the *Liquour* more speedily. This is a *Noble Experiment*, if it be true; For it sheweth Meanes of more *Quicke* and *Easie Infusions*; And it is likewise a good *Instance* of *Attraction*, by *Similitude* of *Substance*. Trie it with *Sugar* put into *Water*, formerly *Sugred*; And into other *Water Unsugred*.

Put *Sugar* into *Wine*, part of it above, part under the *Wine*; And you shall finde, (that which may seeme strange,) that the *Sugar* above the *Wine*, will soften and dissolve sooner, than that within the *Wine*. The Cause is, for that the *Wine* entreteth that *Part* of the *Sugar*, which is under the *Wine*, by *Simple Infusion*, or *Spreading*; But that *Part* above the *Wine*, is likewise forced by *Sucking*: For all *Spongie Bodies* expell the *Aire*, and draw in *Liquour*, if it be *Contiguous*: As we see it also in *Sponges*, put part above the *Water*. It is worthy the *Inquiry*, to see how you may make more *Accurate Infusions*, by *Help* of *Attraction*.

*Water* in *Wells* is warmer in *Winter*, than in *Summer*: And so *Aire* in *Caves*. The Cause is, for that in the *Higher Parts*, under the *Earth*, there is a *Degree* of some *Heat*; (As appeareth in *Sulphureous Veines*, &c.) Which shut close in, (as in *Winter*,) is the *More*; But if it *Perpire*, (as it doth in *Summer*,) it is the *lesse*.

It is reported, that amongst the *Leucadians*, in *Ancient* time, upon a *Superstition* they did use to *Precipitate* a *Man*, from a *High Cliffe* into the *Sea*; Tying about him, with *Strings*, at some distance, many great *Fowles*; And fixing unto his *Body* divers *Feathers*, spred, to breake the *Fall*. Certainly many *Birds* of good *wing*, (As *Kites*, and the like,) would beare up a good *weight*, as they flie; And *Spreading* of *Feathers* thinne, and close, and in great *Breadth*, will likewise beare up a great *weight*; Being even laid, without *Tilting* upon the *Sides*. The further *Extension* of this *Experiment* for *Flying* may be thought upon.

There is, in some *Places*, (namely in *Cephalonia*,) a little *shrub*, which they call *Holy-Oake*, or *Dwarf-Oake*: Upon the *Leaves* whereof there riseth

Experiment  
Solitary, touching the  
Returne of  
Salnesse in  
Pits upon the  
Sea-Shore

882

Experiment  
Solitary, touching  
Attraction by  
Similitude of  
Substance.

883

Experiment  
Solitary, touching  
Attraction.

884

Experiment  
Solitary, touching  
Heat under  
Earth.

885

Experiment  
Solitary, touching  
Flying in the  
Aire.

886

Experiment  
Solitary, touching the  
Dye of Scarlet.

887



feth a *Tumour*, like a *Blister*; Which they gather, and rub out of it, a certaine *Red Dust*, that converteth (after a while) into *wormes*, which they kill with *Wine*, (as is reported,) when they begin to *Quicken*: With this *Dust* they die *Scarlet*.

Experiment  
Solitary, touch-  
ing *Malefici-  
ating*.

888

IN *Zant*, it is very ordinary, to make *Men Impotent*, to accompany with their *Wives*. The like is Practised in *Gasconie*; Where it is called *Nover l'eguilette*. It is practised alwayes upon the *Wedding Day*. And in *Zant*, the Mothers themselves doe it, by way of *Prevention*, Because thereby they hinder other *Charmes*, and can undoe their Owne. It is a Thing the *Civill Law* taketh knowledge of; And therefore is of no *Light Regard*.

Experiment  
Solitary, touch-  
ing the *Rise*  
of *Water* by  
Meanes of  
Flame.

889

IT is a Common *Experiment*, but the *Cause* is mistaken. Take a *Por*, (Or better a *Glasse*, because therein you may see the *Motion*.) And set a *Candle* lighted in the *Bottom* of a *Bason* of *Water*; And turne the *Mouth* of the *Por*, or *Glasse*, over the *Candle*, and it will make the *Water* rise. They ascribe it to the *Drawing* of *Heat*; Which is not true: For it appeareth plainly to bee but a *Motion* of *Nexe*, which they call *Ne detur vacuum*; And it proceedeth thus. The *Flame* of the *Candle*, as soone as it is covered, being suffocated by the *Close Aire*, lesseneth by little and little: During which time, there is some little *Ascent* of *Water*, but not much: For the *Flame* Occupying lesse and lesse *Roome*, as it lesseneth, the *Water* succeedeth. But upon the *Instant* of the *Candles Going out*, there is a sudden *Rise*, of a great deal of *Water*; For that the *Body* of the *Flame* filleth no more *Place*; And so the *Aire*, and the *Water* succeed. It worketh the same *Effect*, if in stead of *Water*, you put *Flower*, or *Sand*, into the *Bason*: Which sheweth, that it is not the *Flames* *Drawing* the *Liquour*, as *Nourishment*; As it is supposed; For all *Bodies* are alike unto it; As it is ever in *Motion* of *Nexe*; In so much as I have seen the *Glasse*, being held by the *Hand*, hath lifted up the *Bason*, and all: The *Motion* of *Nexe* did so *Clasp* the *Bottom* of the *Bason*. That *Experiment*, when the *Bason* was lifted up, was made with *Oyle*, and not with *Water*: Nevertheless this is true, that at the very first *Setting* of the *Mouth* of the *Glasse*, upon the *Bottom* of the *Bason*, it draweth up the *Water* a little, and then standeth at a *Stay*, almost till the *Candles Going out*, as was said. This may shew some *Attraction* at first: But of this we will speake more, when we handle *Attractions* by *Heat*.

Experiments  
in *Consort*,  
touching the  
Influences of  
the *Moone*.

Of the *Power* of the *Celestiall Bodies*, and what more *Secret Influences* they have, besides the two *Manifest Influences* of *Heat*, and *Light*, Wee shall speake, when wee handle *Experiments* touching the *Celestiall Bodies*: Meane-while, wee will give some *Directions* for more certaine *Trialls*, of the *Vertue* and *Influences* of the *Moone*; which is our *Nearest Neighbour*.

The *Influences* of the *Moone*, (most observed,) are *Foure*, The *Drawing forth* of *Heat*: The *Inducing* of *Putrefaction*: the *Increase* of *Moisture*: The *Exciting* of the *Motions* of *Spirits*.

For



For the *Drawing forth of Heat*, we have formerly prescribed to take *Water Warne*, and to set Part of it against the *Moone Beames*, and Part of it with a *Skreene* betweene; And to see whether that which standeth Exposed to the *Beames*, will not *Coole* sooner. But because this is but a *Small Interposition*, (though in the *Sunne* we see a *Small Shade* doth much,) it were good to trie it, when the *Moone* shineth, and when the *Moone* shineth not at all; And with *Water Warne* in a *Glasse-Boule*, as well as in a *Dish*; And with *Cinder*; And with *Iron Red-Hot*; &c.

For the *Inducing of Putrefaction*, it were good to trie it with *Flesh*, or *Fish*, Exposed to the *Moone-Beames*; And againe Exposed to the *Aire*, when the *Moone* shineth not, for the liketime; To see whether will corrupt sooner: And trie it also with *Capon*, or some other *Fowle*, laid abroad, to see whether it will mortifie, and become tender sooner? Trie it also with *Dead Flies*, or *Dead Wormes*, having a little *Water* cast upon them, to see whether will *Putrefie* sooner. Trie it also with an *Apple*, or *Orange*, having *Holes* made in their *Tops*, to see whether will Rot or Mould sooner? Trie it also with *Holland-Cheese*, having *Wine* put into it; whether will breed *Mites* sooner or greater?

For the *Increase of Moisture*, the Opinion Received is; That *Seeds* will grow soonest; And *Haire*, and *Nailles*, and *Hedges*, and *Herbs*, Cut, &c. will grow soonest, if they be Set, or Cut, in the *Increase of the Moone*. Also that *Braines* in *Rabbits*, *Wood-Cocks*, *Calves*, &c. are fullest in the *Full of the Moone*: And so of *Marrow* in the *Bones*; And so of *Oysters*, and *Cockles*, which of all the rest are the easiest tried, if you have them in *Piss*.

Take some *Seeds*, or *Roots*, (as *Onions*, &c.) And set some of them immediately after the *Change*; And others of the same kinde immediately after the *Full*: Let them be as Like as can be: The *Earth* also the Same as neare as may be; And therefore best in *Pots*: Let the *Pots* also stand, where no *Raine*, or *Sunne* may come to them, lest the *Difference of the Weather* confound the *Experiment*: And then see in what Time, the *Seeds* Set in the *Increase of the Moone*, come to a certaine Height; And how they differ from those that are Set in the *Decrease of the Moone*.

It is like, that the *Braine* of *Man* waxeth *Moister*, and *Fuller*, upon the *Full of the Moone*: And therefore it were good for those that have *Moist Braines*, and are great *Drinkers*, to take *Fume of Lignum Aloës*, *Rose-Mary*, *Frankincense*, &c. about the *Full of the Moone*. It is like also, that the *Humours* in *Mens Bodies*, Increase, and Decrease, as the *Moone* doth; And therefore it were good to *Purge*, some day, or two, after the *Full*; For that then the *Humours* will not replenish so soone againe.

As for the *Exciting of the Motion of the Spirits*, you must note that the *Growth of Hedges, Herbs, Haire, &c.* is caused from the *Moone*, by *Exciting of the Spirits*, as well as by *Increase of the Moisture*. But for *Spirits* in particular, the great *Instance* is in *Lunacies*.

There may be other *Secret Effects* of the *Influence of the Moone*, which are not yet brought into *Observation*. It may be, that if it so fall out, that the *Wind* be *North*, or *North-East*, in the *Full of the Moone*, it increaseth *Cold*; And if *South*, or *South-West*, it disposeth the *Aire*, for a good while, to *Warmth*, and *Raine*; Which would be observed.

It may be, that *Children*, and *Young Cattell*, that are Brought forth in the *Full of the Moone*, are stronger, and larger, than those that are brought forth in the *Wane*: And those also which are Begotten in the *Full of the Moone*: So that it might be good *Husbandrie*, to put *Rammies*, and *Bulls* to their

890

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*Females*, somewhat before the *Full* of the *Moone*. It may bee also, that the *Egges* lay'd in the *Full* of the *Moone*, breed the better *Bird*: And a Number of the like *Effects*, which may bee brought into *Observation*: *Quere* also, whether great *Thunders*, and *Earth-Quakes*, be not most in the *Full* of the *Moone*.

Experiment  
Solitary, tou-  
ching *Vinegar*  
898

**T**He *Turning* of *Wine* to *Vinegar*, is a Kind of *Putrefaction*: And in *Making* of *Vinegar*, they use to set *Vessels* of *Wine* over against the *Noone-Sunne*; which calleth out the more *Oylie Spirits*, and leaveth the *Liquour* more *Soure*, and *Hard*. We see also, that *Burnt-Wine* is more *Hard*, and *Astringent*, than *Wine Vnburnt*. It is said that *Cider* in *Navigations* under the *Line* ripeneth, when *Wine* or *Beere* sowreth. It were good to set a *Rundlet* of *Verjuice* over against the *Sunne*, in *Summer*, as they doe *Vinegar*, to see whether it will *Ripen*, and *Sweeten*.

Experiment  
Solitary, tou-  
ching *Crea-  
tures* that  
*Sleep* all  
*Winter*.

899

**T**Here be divers *Creatures*, that *sleep* all *Winter*; As the *Beare*, the *Hedge-hog*, the *Bat*, the *Bee*, &c. These all wax *Fat* when they *sleep*, and egest not. The *Cause* of their *Fatening*, during their *Sleeping time*, may be the *Vwant* of *Assimilating*; For whatsoever *Assimilate*th not to *Flesh*, turneth either to *Sweat*, or *Fat*. These *Creatures*, for part of their *Sleeping-Time*, have beene observed not to *Stirre* at all; And for the other part, to *Stirre*, but not to *Remove*. And they get *Warme* and *Cloſe Places* to *Sleep* in. When the *Flemmings* *Wintred* in *Nova Zembla*, the *Beares*, about the *Middle* of *November*, went to *Sleepe*, And then the *Foxes* began to come forth, which durst not before. It is noted by some of the *Ancients*, that the *Shee-Bear* breedeth, and lyeth in with her *Young*, during that time of *Rest*: And that a *Beare*, *Big* with *Young*, hath feldome beene seene.

Experiment  
Solitary, tou-  
ching the  
*Generation* of  
*Creatures* by  
*Copulating*,  
and by *Putre-  
faction*.

900

**S**ome *Living Creatures* are *Procreated* by *Copulation* betweene *Male*, and *Female*: Some by *Putrefaction*; And of those which come by *Putrefaction*, many doe (nevertheſſe) afterwards procreate by *Copulation*. For the *Cause* of both *Generations*: First, it is most certaine, that the *Cause* of all *Vivification*, is a *Gentle* and *Proportionable Heat*, working upon a *Glutinous* and *Reelding Substance*: For the *Heat* doth bring forth *Spirit* in that *Substance*: And the *Substance*, being *Glutinous*, produceth *Two Effects*: The One, that the *Spirit* is *Detained*, and cannot *Breake forth*: The Other, that the *Matter* being *Gentle*, and *Reelding*, is driven forwards by the *Motion* of the *Spirit*, after some *Swelling* into *Shape*, and *Members*. Therefore all *Sperme*, all *Menstruous Substance*, all *Matter* whereof *Creatures* are produced by *Putrefaction*, have evermore a *Cloſeneſſe*, *Lentour*, and *Sequacitie*. It seemeth therefore, that the *Generation* by *Sperme* onely, and by *Putrefaction*, have two *Different Causes*. The first is, for that *Creatures*, which have a *Definite* and *Exact Shape*, (as those have which are *Procreated* by *Copulation*), cannot be produced by a *Wweake*, and *Casual Heat*; Nor out of *Matter*, which is not *Exactly Prepared*, according to the *Species*. The Second is, for that there is a greater *Time* required, for *Maturation* of *Perfect Creatures*; For if the *Time* required in *Vivification* bee of any length, then the *Spirit* will *Exhale*, before the *Creature* be *Mature*: Except it bee incloſed in a *Place* where it may have *Continuance* of the *Heat*, *Acceſſe* of some *Nouriſhment* to maintaine it, and *Cloſeneſſe* that may keepe it from *Exhaling*. And ſuch

Places



Places, or the *VVombs*, and *Matrices*, of the *Females*. And therefore all *Creatures*, made of *Putrefaction*, are of more *Vncertaine Shape*; And are made in *Shorter Time*; And need not so Perfect an *Enclosure*, though some *Closenesse* be commonly required. As for the *Heathen Opinion*, which was, that upon great *Mutations* of the *VVorld*, *Perfect Creatures* were first Engendred of *Concretion*; As well as *Frogs*, and *VVormes*, and *Flies*, and such like, are now; Wee know it to be vaine: But if any such Thing should be admitted, Discourfing according to *Sense*, it cannot be, except you admit of a *Chaos* first, and *Commixture* of *Heaven* and *Earth*.

For the *Frame* of the *VVorld* once in Order, cannot effect it by any *Excesse*,  
or *Casualty*.

NATU-



stone or the powder, and always, of the powder. And therefore all  
Cements, made of powder, are of more various shape. And are  
made in several ways. And need not to be perfect in shape, though some  
times they be commonly required. As for the Harder Quality, which was  
that upon great quantity of the powder, better Cements were still Engen-  
dered of cement. As well as stone, and powder, and fish, and such  
like, are now. We know it to be vain: But if any such Thing should  
be admitted, Discreting according to sense, it cannot be, except  
you admit of a Chain, fish, and Cement, of Horses and such.  
For the same of the World once in Order, can  
not effect it by any single  
or Casualty.

WATU





# NATVRALL HISTORIE.

## X. Century.

**T**He Philosophie of Pythagoras, (which was full of Superstition,) did first plant a *Monstrous Imagination*, which afterwards was, by the Schoole of Plato, and Others, Watred, and Nourished. It was, That the *World* was *One*, *Entire*, *Perfect*, *Living Creature*; Insomuch as Apollonius of Tyana, a Pythagorean Prophet, affirmed, that the *Ebbing* and *Flowing* of the *Sea*, was the *Respiration* of the *World*, drawing in *Water* as *Breath*, and putting it forth againe. They went on, and inferred; That if the *World* were a *Living Creature*, it had a *Soule*, and *Spirit*; Which also they held, calling it *Spiritus Mundi*; The *Spirit* or *Soule* of the *World*: By which they did not intend *God*; (for they did admit of a *Deity* besides :) But onely the *Soule*, or *Essentiall Forme* of the *Vniuerse*. This *Foundation* being laid, they mought build upon it, what they would; For in a *Living Creature*, though never so great, (As for Example, in a great *Whale*,) the *Sense*, and the *Affects* of any one *Part* of the *Body*, instantly make a *Transcursion* thorow-out the whole *Body*: So that by this they did insinuate, that no distance of *Place*, nor *Want* or *Indisposition* of *Matter*, could hinder *Magical Operations*; But that (for Example,) we mought here in *Europe*, have *Sense* and *Feeling* of that, which was done

Experiments  
in Confort,  
touching the  
*Transmission*,  
and *Influx*, of  
*Immaterial*  
*Vertues*, and  
the Force of  
*Imagination*.



in China: And likewise, we mought worke any *Effect*, without and against *Matter*: And this, not Holpen by the *Cooperation* of *Angels*, or *Spirits*, but onely by the *Vnitie* and *Harmony* of *Nature*. There were some also, that staid not here; but went further, and held; That if the *Spirit* of *Man*, (whom they call the *Microcosme*,) doe give a fit touch to the *Spirit* of the *World*, by strong *Imaginations*, and *Beleefes*, it might command *Nature*; For *Paracelsus* and some darksome *Authors*, of *Magicke*, doe ascribe to *Imagination Exalted*, the *Power* of *Miracle-working Faith*. With these *Vast* and *Bottomlesse Follies*, *Men* have beene (in part) entertained.

But wee, that hold firme to the *Works* of *God*; And to the *Sense*, which is *Gods Lamp*; (*Lucerna Dei Spiraculum Hominis*;) will enquire, with all *Sobrietie*, and *Severity*, whether there be to be found, in the *Foot-steps* of *Nature*, any such *Transmission* and *Influx* of *Immateriate Vertues*; And what the *Force* of *Imagination* is; Either upon the *Body Imaginant*, or upon another *Body*: Wherein it will be like that *Labour* of *Hercules*, in *Purging* the *Stable* of *Augeas*, to separate from *Superstitious*, and *Magicall Arts*, and *Observations*, any thing that is cleane, and pure *Naturall*; And not to be either *Contemned*, or *Condemned*. And although we shall have occasion to speake of this in more *Places* than *One*, yet we will now make some *Entrance* thereinto.

Experiments  
in Consort,  
Monitorie,  
touching  
Transmission of  
Spirits, and  
the Force of  
Imagination.

901

**M**en are to be Admonished, that they doe not with-draw *Credit*, from the *Operations* by *Transmission* of *Spirits*, and *Force* of *Imagination*, because the *Effects* faile sometimes. For as in *Infection*, and *Contagion* from *Body* to *Body*, (as the *Plague*, and the like,) it is most certaine, that the *Infection* is received (many times) by the *Body Passive*, but yet is by the *Strength*, and good *Disposition* thereof, *Repulsed*, and wrought out, before it be formed in a *Disease*; So much more in *Impressions* from *Minde* to *Minde*, or from *Spirit* to *Spirit*, the *Impression* taketh, but is *Encountred*, and *Overcome*, by the *Minde* and *Spirit*, which is *Passive*, before it worke any manifest *Effect*. And therefore they worke most upon *weake Mindes*, and *Spirits*: As those of *women*; *Sicke Persons*; *Superstitious* and *Fearfull Persons*; *Children*, and *Young Creatures*:

*Nescio quis teneros Oculis mihi fascinat Agnos:*

The *Poet* speaketh not of *Sheep*, but of *Lambs*. As for the *weaknesse* of the *Power* of them, upon *Kings*, and *Magistrates*; It may be ascribed (besides the main, which is the *Protection* of *God*, over those that *Execute* his *Place*;) to the *Weaknesse* of the *Imagination* of the *Imaginant*: For it is hard for a *Witch*, or a *Sorcerer*, to put on a *Beliefe*, that they can hurt such *Persons*.

902

*Men* are to be Admonished, on the other side, that they doe not easily give *Place* and *Credit* to these *Operations*, because they *Succeed* many times; For



For the Cause of this Success, is (oft) to be truly ascribed, unto the Force of Affection and Imagination, upon the Body Agent; And then by a Secondary Meanes, it may worke upon a Divers Body: As for Example; If a Man carry a Planets Seale, Or a Ring, or some Part of a Beast, beleeving strongly, that it will help him to obtaine his Love; Or to keep him from danger of hurt in Fight; or to prevaile in a Suit; &c. it may make him more Active, and Industrious; And againe, more Confident, and Persisting, than otherwise he would be. Now the great Effects that may come of Industrie, and Perseverance, (especially in Civill Businesse,) who knoweth not? For wee see Audacity doth almost binde and mate the weaker Sort of Mindes; And the State of Humane Actions is so variable, that to trie Things oft, and never to give over, doth Wonders: Therefore it were a Meere Fallacie and Mistaking, to ascribe that to the Force of Imagination, upon another Body, which is but the Force of Imagination upon the Proper Body: For there is no doubt, but that Imagination, and Vehement Affection, worke greatly upon the Body of the Imaginant: As we shall shew in due place.

Men are to be Admonished, that as they are not to mistake the Causes of these Operations; So, much lesse, they are to mistake the Fact, or Effect; And rashly to take that for done, which is not done. And therefore, as divers wise Judges have prescribed, and cautioned, Men may not too rashly beleev, the Confessions of Witches, nor yet the Evidence against them. For the Witches themselves are Imaginative, and beleev oft-times, they doe that, which they doe not: And People are Credulous in that point, and ready to impute Accidents, and Naturall Operations, to Witch-Craft. It is worthy the Observing, that both in Ancient, and Late times; (As in the Thessalian Witches, and the Meetings of Witches that have beene recorded by so many late Confessions;) the great Wonders which they tell, of Carrying in the Aire, Transforming themselves into other Bodies; &c. are still reported to bee wrought, not by Incantations or Ceremonies; But by Ointments, and Annointing themselves all over: This may justly move a Man to thinke, that these Fables are the Effects of Imagination: For it is certaine, that Ointments doe all, (if they be laid on any thing thicke,) by Stopping of the Pores, shut in the Vapours, and send them to the Head extremely. And for the Particular Ingredients of those Magicall Ointments, it is like they are Opiate, and Soporiferous. For Annointing of the Fore-head, Necke, Feet, Back-Bone, wee know is used for Procuring Dead Sleeps: And if any Man say, that this Effect would bee better done by Inward Portions; Answer may bee made, that the Medicines, which goe to the Ointments, are so strong, that if they were used inwards, they would kill those that use them: And therefore they work Potently, though Outwards.

We will divide the Severall Kinds of the Operations, by Transmission of Spirits, and Imagination; Which will give no small Light to the Experiments that follow. All Operations by Transmission of Spirits, and Imagination have this; That they Work at Distance, and not at Touch; And they are these being distinguished.

The First is the Transmission or Emission, of the Thinner, and more Airy Parts of Bodies; As in Odours, and Infections; And this is, of all the rest, the most Corporeall. But you must remember withall, that there be a Number of those Emissions, both wholesome, and unwholesome, that give no Smell at all:

For



For the *Plague*, many times when it is taken, giveth no *Sent* at all: And there be many *Good* and *Healthfull Aires*, that doe appeare by *Habitation*, and other *Proofes*, that differ not in *Smell* from other *Aires*. And under this *Head*, you may place all *Imbibitions* of *Aire*, where the *Substance* is *Materiall*, *Odour-like*; Whereof some neverthelesse are strange, and very suddenly diffused; As the *Alteration* which the *Aire* receiveth in *Egypt*, almost immediately, upon the *Rising* of the *River* of *Nilus*, whereof we have spoken.

905

The Second is the *Transmission* or *Emission* of those *Things* that wee call *Spirituell Species*; As *Visibles*, and *Sounds*: The one whereof wee have handled; And the other wee shall handle in due place. These move swiftly, and at great distance; But then they require a *Medium* well disposed; And their *Transmission* is easily stopped.

906

The Third is the *Emissions*, which cause *Attraction* of *Certaine Bodies* at *Distance*; Wherein though the *Loadstone* be commonly placed in the *First Ranke*, yet we thinke good to except it, and referre it to another *Head*: but the *Drawing* of *Amber*, and *Iet*, and other *Electricke Bodies*; And the *Attraction* in *Gold* of the *Spirit* of *Quick-Silver*, at distance; And the *Attraction* of *Heat* at distance; And that of *Fire* to *Naphtha*: And that of some *Herbs* to *Water*, though at distance; And divers others; Wee shall handle, but yet not under this present *Title*, but under the *Title* of *Attraction* in generall.

907

The Fourth is the *Emission* of *Spirits*, and *Immateriate Powers* and *Vertues*, in those *Things*, which worke by the *Univerfall Configuration*, and *Sympathy* of the *World*; Not by *Formes*, or *Celestiall Influxes*, (as is vainly taught and received,) but by the *Primitive Nature* of *Matter*, and the *Seeds* of *Things*. Of this kinde is, (as we yet suppose,) the *Working* of the *Loadstone*, which is by *Consent* with the *Globe* of the *Earth*: Of this kinde is the *Motion* of *Gravitate*, which is by *Consent* of *Dense Bodies*, with the *Globe* of the *Earth*: Of this kinde is some *Disposition* of *Bodies* to *Rotation*, and particularly from *East* to *West*: Of which kinde we conceive the *Maine Float* and *Re-float* of the *Sea* is, which is by *Consent* of the *Universe*, as *Part* of the *Diurnall Motion*. These *Immateriate Vertues* have this *Propertie* differing from others; That the *Diversity* of the *Medium* hindereth them not; But they passe through all *Mediums*; yet at *Determinate Distances*. And of these wee shall speake, as they are incident to severall *Titles*.

908

The Fifth is the *Emissions* of *Spirits*; And this is the *Principall* in our *Intention* to handle now in this *Place*: Namely, the *Operation* of the *Spirits* of the *Minde* of *Man*, upon other *Spirits*: And this is of a *Double Nature*: The *Operations* of the *Affections*, if they be *Vehement*; And the *Operation* of the *Imagination*, if it be *Strong*. But these two are so *Coupled*, as we shall handle them together; For when an *Enviuous*, or *Amorous Aspect*, doth infect the *Spirits* of Another, there is *Joyned* both *Affection*, and *Imagination*.

909

The Sixth is, the *Influxes* of the *Heavenly Bodies*, besides those two *Manifest Ones*, of *Heat*, and *Light*. But these we will handle, where we handle the *Celestiall Bodies*, and *Motions*.

910

The Seventh is the *Operations* of *Sympathy*; Which the *Writers* of *Naturall Magicke* have brought into an *Art*, or *Precept*: And it is this; That if you desire to *Super-induce*, any *Vertue* or *Disposition*, upon a *Person*, you should take the *Living Creature*, in which that *Vertue* is most *Eminent*, and in *Perfection*: Of that *Creature* you must take the *Parts*, wherein that *Vertue* chiefly is *Collocate*: Againe, you must take those *Parts*, in the *Time*, and *Act*, when that *Vertue* is most in *Exercise*; And then you must apply it to that



*Part of Man*, wherein that *Virtue* chiefly *Consisteth*. As if you would Super-induce *Courage* and *Fortitude*, take a *Lion*, or a *Cocke*; And take the *Heart*, *Tooth*, or *Paw* of the *Lion*; Or the *Heart*, or *Spurre* of the *Cocke*: Take those *Parts* immediately after the *Lion*, or the *Cocke* have beene in *Fight*; And let them be worne, upon a *Mans-Heart*, or *Wrest*. Of these and such like *Sympathies*, we shall speake under this present *Title*.

The Eighth and last is, an *Emission* of *Immaterial Vertues*; Such as wee are a little doubtfull to Propound; It is so prodigious: But that it is so constantly avouched by many: And we have set it downe, as a Law to our Selves, to examine things to the Bottom; And not to receive upon Credit, or reject upon Improbabilities, untill there hath passed a due Examination. This is, the *Sympathy* of *Individuals*: For as there is a *Sympathy* of *Species*; So, (it may be) there is a *Sympathy* of *Individuals*: That is, that in *Things*, or the *Parts* of *Things* that have beene once *Contiguous*, or *Entire*, there should remain a *Transmission* of *Virtue* from the One to the Other: As betweene the *Weapon*, and the *Wound*. Whereupon is blazed abroad the *Operation* of *Vnguentum Teli*: And so of a *Peece* of *Lard*, or *Sticke* of *Elder*, &c. that if *Part* of it be Consumed or Putrified, it will worke upon the other *Part Severed*. Now we will pursue the *Instances* themselves.

**T**He *Plague* is many times taken without *Manifest Sense*, as hath beene said. And they report, that where it is found, it hath a *Sent*, of the *Smell* of a *Mellow Apple*; And (as some say) of *May Flowers*: And it is also received, that *Smells* of *Flowers* that are *Mellow* and *Lushious*, are ill for the *Plague*; As *White-Lillies*, *Conslips*, and *Hyacinths*.

The *Plague* is not easily received by such, as continually are about them, that have the *Plague*; As *Keepers* of the *Sicke*, and *Physitians*; Nor againe by such as take *Antidotes*, either *Inward*, (as *Mithridate*; *Iuniper-Berries*; *Rue*, *Leafe*, and *Seed*; &c.) Or *Outward*, (as *Angelica*, *Zedoary*, and the like, in the *Mouth*; *Tarre*, *Galbanum*, and the like, in *Perfume*;) Nor againe by *Old People*, and such as are of a *Drie* and *Cold Complexion*. On the other side, the *Plague* taketh soonest hold of those, that come out of a *Fresh Aire*; And of those that are *Fasting*; And of *Children*; And it is likewise noted to goe in a *Bloud*, more than to a *Stranger*.

The most *Pernicious Infection*, next the *Plague*, is the *Smell* of the *Iayle*, When *Prisoners* have beene *Long*, and *Close*, and *Nastily* kept; Whereof we have had, in our time, *Experience*, twice or thrice; when both the *Judges* that sate upon the *Iayle*, and *Numbers* of those that attended the *Businesse*, or were present, *Sickned* upon it, and *died*. Therefore it were good wisdome, that in such Cases, the *Iayle* were *Aired*, before they be brought forth.

Out of question, if such *Foule Smells* bee made by *Art*, and by the *Hand*, they consist chiefly of *Mans Flesh*, or *Sweat*, *Putrified*; For they are not those *Stinks*, which the *Nostbrils* straight abhorre, and expell, that are most *Pernicious*; But such *Aires*, as have some similitude with *Mans Body*; And so insinuate themselves, and betray the *Spirits*. There may bee great danger, in using such *Compositions*, in great Meetings of *People*, within *Houses*; As in *Churches*; At *Arraignments*; At *Playes* and *Solemnities*; And the like; For *Poysoning* of *Aire* is no lesse dangerous than *Poysoning* of *Water*; Which hath been used by the *Turks* in the *Warres*; And was used by *Emanuel Comnenus* towards the *Christians*, when they passed thorow his *Countrie* to the *Holy Land*. And these *Empoysonments* of *Aire*, are the more dangerous in *Meetings* of *People*; Because the much *Breath* of *People*, doth further the *Reception* of the

911

Experiments  
in Confort  
touching  
Emission of  
Spirits in Va-  
pour, or Ex-  
halation,  
& dew-like.

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915



the *Infection* : And therefore, where any such thing is feared, it were good, those *Publique Places* were perfumed, before the *Assemblies*.

916

The *Empoysonment* of Particular Persons, by *Odours*, hath beene reported to be in *Perfumed Gloves*, or the like : And it is like, they Mingle the *Poyson* that is deadly, with some *Smells* that are Sweet, which also maketh it the sooner received. *Plagues* also have beene raised by *Annointings* of the *Chincks* of *Doores*, and the like; Not so much by the *Touch*, as for that it is common for *Men*, when they finde any thing Wet upon their *Fingers*, to put them to their *Nose*; Which *Men* therefore should take heed how they doe. The best is, that these *Compositions* of *Infectious Aires*, cannot be made without *Danger of Death*, to them that make them. But then againe, they may have some *Antidotes* to save themselves; So that *Men* ought not to be secure of it.

917

There have beene, in divers *Countries*, great *Plagues*, by the *Purefaction*, of great *Swarms* of *Grasse-Hoppers*, and *Locusts*, when they have beene dead, and cast upon *Heaps*.

918

It happeneth oft in *Mines*, that there are *Damps*, which kill, either by *Suffocation*, or by the *Poysonous Nature* of the *Minerall* : And those that deale much in *Refining*, or other *Workes* about *Metals*, and *Mineralls*, have their *Braines* Hurt and *Stupefied* by the *Metalline Vapours*. Amongst which, it is noted, that the *Spirits* of *Quick-Silver*, ever flie to the *Skull*, *Teeth*, or *Bones*; Insomuch as *Gilders* use to have a *Peece of Gold* in their *Mouth*, to draw the *Spirits* of the *Quick-Silver*; Which *Gold* afterwards they finde to be *Whitened*. There are also certaine *Lakes*, and *Pits*, such as that of *Avernus*, that *Poyson Birds*, (as is said,) which fly over them; Or *Men*, that stay too long about them.

919

The *Vapour* of *Char-Coale*, or *Sea-Coale*, in a *Close Roome*, hath killed many : And it is the more dangerous, because it commeth without any *Ill Smell*; But stealeth on by little and little, Enducing onely a *Faintnesse*, without any *Manifest Strangling*. When the *Dutch-Men* Wintred at *Nova Zembla*, and that they could gather no more *Sticks*, they fell to make *Fire* of some *Sea-Coale* they had, wherewith (at first) they were much refreshed; But a little after they had sit about the *Fire*, there grew a *Generall Silence*, and lothnesse to speake amongst them; And immediately after, One of the *Weakest* of the *Company*, fell down in a *Swoone*; Whereupon they doubting what it was, opened their doore, to let in *Aire*, and so saved themselves. The *Effect* (no doubt) is wrought by the *Insuffiation* of the *Aire*; And so of the *Breath*, and *Spirits*. The like ensueth in *Roomes* newly *Plaistered*, if a *Fire* bee made in them; Whereof no lesse *Man* than the *Emperour Iovianus* Died.

920

Vide the *Experiment*, 803. touching the *Infectious Nature* of the *Aire*, upon the *First Showers*, after long *Drought*.

921

It hath come to passe, that some *Apothecaries*, upon *Stamping* of *Coloquintida*, have beene put into a great *Skouring*, by the *Vapour* onely.

922

It hath beene a *Practice*, to burne a *Pepper*, they call *Ginny-Pepper*, Which hath such a strong *Spirit*, that it provoketh a *Continuall Sneezing*, in those that are in the *Roome*.

923

It is an *Ancient Tradition*, that *Bleare-Eyes* infect *Sound Eyes*; And that a *Menstruous Woman*, looking upon a *Glasse*, doth rust it. Nay they have an *Opinion*, which seemeth *Fabulous*; That *Menstruous Women*, going over a *Field*, or *Garden*, doe *Corne* and *Herbs* good by *Killing* the *Wormes*.

924

The *Tradition* is no lesse *Ancient*, that the *Basiliske* killeth by *Affect*; And that



that the *Wolfe*, if he see a *Man* first, by *Aspect* striketh a *Man* hoarse.

*Perfumes* Convenient doe drie and strengthen the *Brain*; And stay *Rheumes* and *Defluxions*; As we finde in *Fume* of *Rose-Mary* dried, and *Lignum Aloës*, and *Calamus* taken at the *Mouth*, and *Nostrils*; And no doubt there be other *Perfumes*, that doe moisten, and refresh; And are fit to be used in *Burning Agues*, *Consumptions*, and too much *Wakefulness*; Such as are, *Rose-Water*, *Vinegar*, *Limon-Pills*, *Violets*, the *Leaves* of *Vines* sprinkled with a little *Rose-Water*, &c.

They doe use in *Sudden Faintings*, and *Swounings*, to put a *Handkerchiefe* with *Rose-Water*, or a *Little Vinegar*, to the *Nose*; Which gathereth together againe the *Spirits*, which are upon point to resolve, and fall away.

*Tobacco* comforteth the *Spirits*, and dischargeth *Wearinesse*; Which it worketh, partly by *Opening*; But chiefly by the *Opiate Vertue*, which condenseth the *Spirits*. It were good therefore to trie the *Taking* of *Fumes* by *Pipes*, (as they doe in *Tobacco*;) of other *Things*; As well to drie, and comfort, as for other *Intentions*. I wish *Triall* bee made of the *Drying Fume*, of *Rose-Mary*, and *Lignum-Aloës*, before mentioned, in *Pipe*; And so of *Nutmeg*, and *Folium Indum*; &c.

The *Following* of the *Plough*, hath beene approved, for *Refreshing* the *Spirits*, and *Procuring Appetite*: But to doe it in the *Ploughing* for *Wheat*, or *Rye*, is not so good; Because the *Earth* hath spent her *Sweet Breath*, in *Vegetables*, put forth in *Summer*. It is better therefore to doe it when you sow *Barley*. But because *Ploughing* is tied to *Seasons*, it is best to take the *Aire* of the *Earth*, new turned up, by *Digging* with the *Spade*; Or *Standing* by him that *Diggeth*. *Gentlemen* may doe themselves much good by kneeling upon a *Cushion*, and *VVeeding*. And these *Things* you may praise in the best *Seasons*; Which is ever the *Early Spring*, before the *Earth* putteth forth the *Vegetables*; And in the *Sweetest Earth* you can chuse. It would be done also, when the *Dew* is a little off the *Ground*, lest the *Vapour* bee too *Moist*. I knew a great *Man*, that lived Long, who had a *Clean Clod* of *Earth*, brought to him every *Morning*, as hee sate in his *Bed*; And he would hold his *Head* over it, a good pretty while. I commend also, sometimes, in *Digging* of *New Earth*, to poure in some *Malmesey*, or *Greeke Wine*; That the *Vapour* of the *Earth*, and *VVine* together, may comfort the *Spirits*, the more; Provided alwayes, it be not taken, for a *Heathen Sacrifice*, or *Libation* to the *Earth*.

They have, in *Physicke*, Use of *Pomanders*, and *Knots* of *Powders*, for *Drying* of *Rheumes*, *Comforting* of the *Heart*, *Provoking* of *Sleepe*, &c. For though those things be not so strong as *Perfumes*, yet you may have them continually in your *Hand*; whereas *Perfumes* you can take but at *Times*; And besides, there be divers *Things*, that breath better of themselves, than when they come to the *Fire*; As *Nigella Romana*; the *Seed* of *Melanthium*, *Amomum*; &c.

There be two *Things*, which (inwardly used) doe *Coole* and *condense* the *Spirits*; And I wish the same to be tried outwardly in *Vapours*. The One is *Nitre*, which I would have dissolved in *Malmesey*, or *Greeke-VVine*, and so the *Smell* of the *VVine* taken; Or if you would have it more forcible, poure of it upon a *Fire-pan*, well heated, as they doe *Rose-water* and *Vinegar*. The Other is the *Distilled VVater* of *VVilde Poppey*, which I wish to bee mingled, at halfe, with *Rose-VVater*, and so taken with some *Mixture* of a few *Cloves*, in a *Perfuming-Pan*. The like would be done with the *Distilled VVater* of *Saffron Flowers*.



931

Smells of *Muske*, and *Amber*, and *Civitt*, are thought to further *Venerous Appetite*: Which they may doe by the *Refreshing* and *calling forth* of the *Spirits*.

932

*Incense*, and *Nidorous Smells*, (such as were of *Sacrifices*,) were thought to *Intoxicate* the *Braine*, and to *dispose Men* to *Devotion*: Which they may doe by a kinde of *Sadnesse*, and *Contristation* of the *Spirits*: And partly also by *Heating*, and *Exalting* them. We see, that amongst the *Jewes*, the *Principall Perfume* of the *Sanctuary*, was forbidden all *Common Uses*.

933

There be some *Perfumes*, prescribed by the *Writers* of *Naturall Magicke*, which procure *Pleasant Dreames*; And some others, (as they say,) that procure *Propheticall Dreames*; As the *Seeds* of *Flax*, *Flea-wort*, &c.

934

It is certaine, that *Odours* doe, in a small Degree, *Nourish*; Especially the *Odour* of *Wine*: And wee see *Men* hungred, doe love to smell *Hot Bread*. It is related, that *Democritus*, when he lay a dying, heard a *woman*, in the *House*, complaine, that shee should bee kept from being at a *Feast*, and *Solemnity*, (which she much desired to see,) because there would be a *Corps* in the *House*; Whereupon he caused *Loaves* of *New Bread* to bee sent for, and opened them; And powred a little *Wine* into them; And so kept himselfe alive with the *Odour* of them, till the *Feast* was past. I knew a *Gentleman*, that would fast (sometimes) three or foure, yea five dayes, without *Meat*, *Bread*, or *Drinke*; But the same *Man* used to have continually, a great *Wisp* of *Herbs*, that hee smelled on: And amongst those *Herbs*, some *Esculent* *Herbs* of strong *Sent*; As *Onions*, *Garlick*, *Leekes*, and the like.

935

They doe use, for the *Accident* of the *Mother*, to burne *Feathers*, and other *Things* of *Ill Odour*: And by those *Ill Smells*, the *Rising* of the *Mother* is put downe.

936

There be *Aires*, which the *Physitians* advise their *Patients* to remove unto, in *Consumptions*, or upon *Recovery* of *Long Sickneses*: Which (commonly are *Plaine Champaignes*, but *Grasing*, and not *Over-growne* with *Heath*, or the like: Or else *Timber-Shades*, as in *Forrests*, and the like. It is noted also, that *Groves* of *Bayes* doe forbid *Pestilent Aires*; Which was accounted a great *Cause* of the *Wholesome Aire* of *Antiochia*. There be also some *Soyles* that put forth *Odorate Herbs* of themselves; As *wilde Thyme*; *wilde Marjoram*; *Penny-Royall*; *Camomill*; And in which the *Briar-Roses* smell almost like *Muske-Roses*; Which (no doubt) are *Signes* that doe discover an *Excellent Aire*.

937

It were good for *Men*, to thinke of having *Healthfull Aire*, in their *Houses*; Which will never be, if the *Roomes* be *Low-Roofed*, or full of *Windowes*, and *Doores*; For the one maketh the *Aire Close*, and not *Fresh*; And the other maketh it *Exceeding Vnequall*; Which is a great *Enemy* to *Health*. The *Windowes* also should not be high up to the *Roofe*, (which is in use for *Beautie*, and *Magnificence*,) but *Low*. Also *Stone-Walls* are not *wholesome*; But *Timber* is more *wholesome*; And especially *Brick*, Nay it hath beene used by some, with great *Success*, to make their *Walls* thick; And to put a *Lay* of *Chalke* betweene the *Bricks*, to take away all *Dampishnesse*.

Experiment  
Solitary, touching the  
Emissions of  
Spirituall Species which  
Affect the  
Senses.

938

THESE *Emissions* (as we said before,) are handled, and ought to be handled, by themselves, under their *Proper Titles*: That is, *Visibles*, and *Audibles*, each a-part: In this Place, it shall suffice to give some generall *Observations*, Common to both. First, they seeme to bee *Incorporeall*. Secondly, they *Worke Swiftly*. Thirdly, they *Worke* at *Large Distances*. Fourthly, in *Curious Varieties*. Fifthly, they are not *Effective* of any *Thing*; Nor leave no

Vvorke



worke behinde them; But are *Energies* meerely; For their *Working* upon *Mirrouns*, and *Places of Echo*, doth not alter any Thing in those *Bodies*; But it is the same *Action* with the *Originall*, onely *Repercussed*. And as for the *Shaking of Windowes*, or *Rarifying the Aire* by *Great Noises*; And the *Hear* caused by *Burning-Glasses*; They are rather *Concomitants* of the *Audible*, and *Visible Species*, than the *Effects* of them. Sixthly, they seeme to be of so *Tender*, and *weake a Nature*, as they affect onely such a *Rare*, and *Attenuate Substance*, as is the *Spirit of Living Creatures*.

IT is mentioned in some *Stories*, that where *Children* have beene *Exposed*, or taken away young from their *Parents*; And that afterward they have approached to their *Parents* presence, the *Parents*, (though they have not knowne them,) have had a *Secret Joy*, or Other *Alteration* thereupon.

There was an *Egyptian South-Sayer*, that made *Anthonius* beleeeve, that his *Genius*, (which otherwise was *Brave*, and *Confident*,) was, in the Presence of *Octavianus Caesar*, *Poore*, and *Cowardly*: And therefore, he advised him, to absent himselfe, (as much as he could,) and remove farre from him. The *South-Sayer* was thought to be suborned by *Cleopatra*, to make him live in *Egypt*, and other *Remote Places* from *Rome*. Howsoever the *Conceit* of a *Predominant* or *Mastering Spirit* of one *Man* over Another, is *Ancient*, and Received *Still*, even in *Vulgar Opinion*.

There are *Conceits*, that some *Men*, that are of an *Ill*, and *Melancholy Nature*, doe incline the *Company*, into which they come, to be *Sad*, and *Ill disposed*; And contrariwise, that Others, that are of a *Ioviall Nature*, doe dispose the *Company* to be *Merry* and *Cheerfull*. And againe, that some *Men* are *Luckie* to bee kept *Company* with, and *Employed*; And others *Vnluckie*. Certainly, it is agreeable to *Reason*, that there are, at the least, some *Light Effluxions* from *Spirit to Spirit*, when *Men* are in *Presence* one with another, as well as from *Body to Body*.

It hath beene observed, that *Old Men*, who have loved *Young Company*, and beene *Conversant* continually with them, have beene of *Long Life*; Their *Spirits*, (as it seemeth,) being *Recreated* by such *Company*. Such were the *Ancient Sophists*, and *Rhetoricians*; Which ever had *Young Auditours*, and *Disciples*; As *Gorgias*, *Protagoras*, *Isoocrates*, &c. Who lived till they were an *Hundred yeares Old*. And so likewise did many of the *Grammarians*, and *Schoole-Masters*; such as was *Orbilius*, &c.

*Audacitie* and *Confidence* doth, in *Civill Businesse*, so great *Effects*, as a *Man* may (reasonably) doubt, that besides the very *Daring*, and *Earnestnesse*, and *Perfisting*, and *Importunitie*, there should be some *Secret Binding*, and *Sidoping* of other *Mens Spirits*, to such *Persons*.

The *Affections* (no doubt) doe make the *Spirits* more *Powerfull*, and *Active*; And especially those *Affections*, which draw the *Spirits* into the *Eyes*: Which are two: *Love*, and *Envy*, which is called *Oculus Malus*. As for *Love*, the *Platonists*, (some of them,) goe so farre, as to hold that the *Spirit* of the *Lover*, doth passe into the *Spirit* of the *Person Loved*; Which causeth the desire of *Returne* into the *Body*, whence it was *Emitted*: Whereupon followeth that *Appetite* of *Contraſt*, and *Conjunction*, which is in *Lovers*. And this is observed likewise, that the *Aspects* that procure *Love*, are not *Gazings*, but *Sudden Glances*, and *Dartings* of the *Eye*. As for *Envy*, that emitteeth some *Maligne* and *Poysonous Spirits*, which taketh hold of the *Spirit* of Another; And is likewise of greatest *Force*, when the *Cast* of the *Eye* is *Oblique*. It hath beene noted also, that it is most *Dangerous*, when an

Experiments  
in Consort,  
touching the  
Emission or  
Immaterialle  
Vertues from  
the Mindes,  
and Spirits of  
Men, either  
by Affections,  
or by Imagin-  
ations, or by  
other Impres-  
sions.

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*Envious Eye* is cast upon *Persons* in *Glory*, and *Triumph*, and *Joy*. The *Reason* whereof is, for that, at such times, the *Spirits* come forth most, into the *Outward Parts*, and so meet the *Percussion* of the *Envious Eye*, more at *Hand*: And therefore it hath beene noted, that after great *Triumphs*, *Men* have been ill disposed, for some *Dayes* following. We see the *Opinion* of *Fascination* is *Ancient*; for both *Effects*; Of *Procuring Love*; And *Sickness* caused by *Envie*: And *Fascination* is ever by the *Eye*. But yet if there be any such *Infection* from *Spirit* to *Spirit*, there is no doubt, but that it worketh by *Presence*, and not by the *Eye* alone; Yet most *Forcibly* by the *Eye*.

*Fear*, and *Shame*, are likewise *Infective*; For we see that the *Starting* of one will make another ready to *Start*: And when one *Man* is out of *Courtenance* in a *Company*, others doe likewise *Blush* in his behalfe.

Now we will speake of the *Force* of *Imagination* upon other *Bodies*; and of the *Meanes* to *Exalt* and *Strengthen* it. *Imagination*, in this Place, I understand to bee, the *Representation* of an *Individuall Thought*. *Imagination* is of three *Kindes*: The *First* *Joyned* with *Beleeve* of that which is to *Come*: The *Second* *Joyned* with *Memorie* of that which is *Past*; And the *Third* is of *Things Present*, or as if they were *Present*; For I comprehend in this, *Imagination Faigned*, and at *Pleasure*; As if one should *Imagine* such a *Man* to bee in the *Vestments* of a *Pope*; Or to have *Wings*. I single out, for this time, that which is with *Faith*, or *Beleeve* of that which is to *Come*. The *Inquisition* of this *Subject*, in our way, (which is by *Induction*,) is wonderfull hard; For the *Things* that are reported, are full of *Fables*; And *New Experiments* can hardly bee made, but with *Extreme Caution*; For the *Reason* which wee will after declare.

The *Power* of *Imagination* is in three *Kindes*; The *First*, upon the *Body* of the *Imaginant*; Including likewise the *Child* in the *Mothers Womb*; The *Second* is, the *Power* of it upon *Dead Bodies*, as *Plants*, *Wood*, *Stone*, *Metall*, &c. The *Third* is, the *Power* of it, upon the *Spirits* of *Men*, and *Living Creatures*; And with this last we will onely meddle.

The *Probleme* therefore is, whether a *Man Constantly* and *Strongly Beleeving*, that such a *Thing* shall be; (As that such an *One* will *Love Him*; Or that such an *One* will *Grant Him* his *Request*; Or that such an *One* shall *Recover* a *Sickness*; Or the like;) It doth help any thing to the *Effecting* of the *Thing* it selfe. And here againe we must warily distinguish; For it is not meant, (as hath beene partly said before,) that it should help by *Making* a *Man More Stout*, or more *Industrious*; (in which kinde a *Constant Beleeve* doth much;) But meere by a *Secret Operation*,



ration, or Binding, or Changing the Spirit of Another: And in this it is hard (as wee began to say,) to make any *New Experiment*; For I cannot command my Selfe to *Beleeve* what I will, and so no *Triall* can be made. Nay it is worse; For whatsoever a *Man Imagineth* doubtingly, or with *Feare*, must needs doe hurt, if *Imagination* have any *Power* at all; For a *Man* representeth that oftner, that he feareth, than the contrary.

The Help therefore is, for a *Man* to worke by *Another*, in whom he may Create *Beleeve*, and not by *Himselfe*; untill *Himselfe* have found by *Experience*, that *Imagination* doth prevaile; For then *Experience* worketh in *Himselfe* *Beleeve*; if the *Beleeve*, that such a *Thing* shall be, be joyned with a *Beleeve*, that his *Imagination* may procure it.

For Example, I related one time to a *Man*, that was Curious, and Vaine enough in these Things; That I saw a kinde of *Jugler*, that had a Paire of Cards, and would tell a *Man* what Card he thought. This Pretended Learned Man told mee; It was a Mistaking in Mee; For (said he) it was not the Knowledge of the Mans Thought, for that is Proper to God,) but it was the Inforcing of a Thought upon him, and Binding his *Imagination* by a Stronger, that hee could Think no other Card. And thereupon he asked me a *Question*, or two, which I thought, he did but cunningly, knowing before what used to be the *Fears* of the *Jugler*. Sir; (said hee,) doe you remember whether he told the Card, the *Man* thought, *Himselfe*, or bade *Another* to tell it. I answered (as was true;) That he bade *Another* tell it. Whereunto he said; So I thought: For (said he) *Himselfe* could not have put on so strong an *Imagination*; But by telling the other the Card, (who beleeved that the *Jugler* was some Strange Man, & could doe Strange Things,) that other *Man* caught a strong *Imagination*. I hearkened unto him, thinking for a *Vanity* he spoke prettily. Then he asked mee another *Question*: Saith he; Doe you remember, whether he had the *Man* think the Card first, and afterwards told the other *Man* in his *Eare*, what he should thinke; Or else that hee did whisper first in the Mans *Eare*, that should tell the Card, telling that such a *Man* should thinke such a Card, and after bade the *Man* thinke a Card? I told him, as was true; That he did first whisper the *Man* in the *Eare*, that such a *Man* should thinke such a Card: upon this the *Learned Man* did much Exult, and Please himselfe, saying; Loe, you may see that my *Opinion* is right: For if the *Man* had thought first, his Thought had beene fixed: But the other *Imagining* first, bound his Thought. Which though it did somewhat sink with mee, yet I made it Lighter than I thought, and said; I thought it was *Confederacy*, betweene the *Juggler*, and the two *Servants*: Though (indeed) I had no Reason so to thinke: For they were both my *Fathers* *Servants*; And hee had never plaid in the House before. The *Jugler* also did cause a *Garter* to bee held up; And tooke upon him, to know, that such an One, should point in such a *Place*, of the *Garter*; As it should be neare so many  *Inches* to the *Longer End*, and so many to the *Shorter*; And still hee did it, by First Telling the *Imaginer*, and after Bidding the *Asseur* Thinke.

Having told this *Relation*, not for the Weight thereof, but because it doth hand somely open the *Nature* of the *Question*; I



returne to that I said, That *Experiments of Imagination*, must be practised by Others, and not by a *Mans Selfe*. For there bee Three *Meanes* to fortifie *Beleeve*: The First is *Experience*: The Second is *Reason*: And the Third is *Authoritie*: And that of these, which is farre the most *Potent*, is *Authoritie*: For *Beleeve* upon *Reason*, or *Experience*, will Stagger.

947

For *Authority*, it is of two Kinds; *Beleeve* in an *Art*; And *Beleeve* in a *Man*. And for Things of *Beleeve* in an *Art*; A *Man* may exercise them by *Himselfe*; But for *Beleeve* in a *Man*, it must be by *Another*. Therefore, if a *Man* beleeve in *Astrologie*, and finde a *Figure* Prosperous; Or beleeve in *Naturall Magick*, and that a *Ring* with such a *Stone*, or such a *Peece* of a *Living Creature*, Carried, will doe good; It may help his *Imagination*: But the *Beleeve* in a *Man* is farre the more *Active*. But howsoever, all *Authority* must bee out of a *Mans Selfe*, turned (as was said,) either upon an *Art*, or upon a *Man*: And where *Authority* is from one *Man* to another, there the Second must bee *Ignorant*, and not *Learned*, or *Full of Thoughts*; And such are (for the most part,) all *Witches*, and *Superstitious Persons*; Whose *Beleeves*, tied to their *Teachers*, and *Traditions*, are no whit controlled, either by *Reason*, or *Experience*: And upon the same Reason, in *Magick*, they use (for the most part,) *Boyes*, and *Young People*; whose *Spirits* easiliest take *Beleeve*, and *Imagination*.

Now to fortifie *Imagination*, there be three wayes: The *Authoritie* whence the *Beleeve* is derived; *Meanes* to *Quicken* and *Corroborate* the *Imagination*; And *Meanes* to *Repeat* it, and *Refresh* it.

948

For the *Authoritie*, we have already spoken: As for the Second; Namely the *Meanes* to *Quicken* and *Corroborate* the *Imagination*; We see what hath been used in *Magick*; (If there be in those *Practises* any thing that is purely *Naturall*;) As *Vestments*; *Characters*; *Words*; *Seales*; Some parts of *Plants*, or *Living Creatures*; *Stones*; *Choice* of the *House*; *Gestures* and *Motions*; Also *Incenses*, and *Odours*; *Choice* of *Societie*, which increaseth *Imagination*; *Diets* and *Preparations* for some time before. And for *Words*, there have beene ever used, either *Barbarous Words*, of no Sense, lest they should disturb the *Imagination*; Or *Words* of *Similitude*, that may second and feed the *Imagination*: And this was ever as well in *Heathen Charmes*, as in *Charmes* of latter Times. There are used also *Scripture-words*; For that the *Beleeve*, that *Religious Texts*, and *Words* have Power, may strengthen the *Imagination*. And for the same Reason, *Hebrew Words*, (which amongst us is counted the *Holy Tongue*, and the *Words* more *Mysticall*;) are often used.

949

For the *Refreshing* of the *Imagination*, (which was the Third *Meanes* of *Exalting* it;) We see the *Practises* of *Magick*, as in *Images* of *Wax*, and the like, that should Melt by little, and little; Or some other *Things Buried* in *Mucke*, that should Putrifie by little and little; Or the like: For so oft as the *Imaginant* doth thinke of those *Things*, so oft doth hee represent to his *Imagination*, the *Effect* of that he desireth.

950

If there be any Power in *Imagination*, it is lesse credible, that it should bee so *Incorporeall* and *Immateriall* a *Vertue*, as to worke at great *Distances*; Or through all *Mediums*; Or upon all *Bodies*: But that the *Distance* must be competent; The *Medium* not *Adverse*; And the *Body* Apt and Proportionate. Therefore if there bee any Operation upon *Bodies*, in Absence by Nature;

it



it is like to bee conveyed from *Man* to *Man*, as *Fame* is; As if a *Witch*, by *Imagination*, should hurt any a farre off, it cannot bee naturally, but by *Working* upon the *Spirit* of some, that commeth to the *Witch*; And from that *Party* upon the *Imagination* of *Another*; And so upon *Another*; till it cometo one that hath resort to the *Partie Intended*; And so by *Him* to the *Partie intended himse*lfe. And although they speake, that it sufficeth, to take a *Point*, or a *Peece* of the *Garment*, or the *Name* of the *Partie*, or the like, yet there is lesse *Credit* to be given to those *Things*, except it be by *Working* of evill *Spirits*.

The *Experiments*, which may certainly demonstrate the *Power* of *Imagination*, upon other *Bodies*, are few, or none: For the *Experiments* of *Witchcraft*, are no cleare *Proofes*; For that they may bee, by a *Tacite Operation* of *Maligne Spirits*: Wee shall therefore be forced in this *Enquire*, to resort to New *Experiments*: Wherein we can give onely *Directions* of *Trialls*, and not any *Positive Experiments*. And if any *Man* thinke, that we ought to have stayed, till wee had made *Experiment*, of some of them, our selves, (as we doe commonly in other *Ti*tles,) the *Truth* is, that these *Effects* of *Imagination* upon other *Bodies*, have so little *Credit* with us, as wee shall trie them at leisure: But in the meane *Time*, we will lead others the vway.

When you worke by the *Imagination* of *Another*, it is necessary, that He, by whom you worke, have a *Precedent Opinion* of you, that you can doe *Strange Things*; Or that you are a *Man of Art*, as they call it; For else the *Simple Affirmation* to *Another*, that this or that shall bee, can worke but a weake *Impression*, in his *Imagination*.

It were good, because you cannot discern fully of the *Strength* of *Imagination*, in one *Man* more than another, that you did use the *Imagination* of more than *One*; That so you may light upon a *Strong One*. As if a *Physician* should tell *Three*, or *Foure*, of his *Patient*s *Servants*, that their *Master* shall surely recover.

The *Imagination* of *One*, that you shall use, (such is the *Variety* of *Mens* *Mindes*;) cannot be alwayes alike *Constant*, and *Strong*; And if the *Success*e follow not speedily, it will faint and leese *Strength*. To remedy this, you must pretend to Him, whose *Imagination* you use, severall *Degrees* of *Means*, by which to *Operate*; As to prescribe him, that every *Three Dayes*, if hee finde not the *Success*e *Apparent*, he doe use another *Root*, or *Part* of a *Beast*, or *Ring*, &c. As being of more *Force*; And if that faile, *Another*; And if that, *Another*; till *Seven Times*. Also you must prescribe a good *Large Time* for the *Effect* you promise; As if you should tell a *Servant* of a *Sick-Man*, that his *Master* shall recover, but it will bee *Fourteene dayes*, ere he findeth it apparently, &c. All this to entertaine the *Imagination*, that it waver lesse.

It is certaine, that *Potions*, or *Things* taken into the *Body*: *Incenses* and *Perfumes* taken at the *Nostrils*; And *Oynments* of some *Parts*; doe (naturally) worke upon the *Imagination* of Him that taketh them. And therefore it must needs greatly *Cooperate* with the *Imagination* of him, whom you use, if you prescribe him, before he doe use the *Receit*, for the worke which he desireth, that he doe take such a *Pill*, or a *Spoonfull* of *Liquour*; Or burne such an *Incense*; Or *Annoint* his *Temples*, or the *Soles* of his *Feet*, with such an *Ointment*.



ment, or Oyle: And you must chuse, for the Composition of such Pill, Perfume, or Oyniment, such Ingredients, as doe make the Spiritus, a little more grosse, or Muddy; Whereby the Imagination will fix the better.

955

The Body Passive, and to be wrought vpon, (I meane not of the Imaginant,) is better wrought upon, (as hath beene partly touched) at some Times, than at others: as if you should prescribe a Servant, about a Sicke Person, (whom you have possessed, that his Master shall recover,) when his Master is fast asleepe, to use such a Root, or such a Root. For Imagination is like to worke better upon Sleeping Men, than Men Awake; As wee shall shew when wee handle Dreames.

956

We finde in the Art of Memory, that Images Visible, worke better than other Conceits: As if you would remember the Word Philosophy, you shall more surely doe it, by Imagining, that such a Man, (For Men are best Places,) is reading upon Aristotiles Physicks; Than if you should Imagine him to say; I'll goe study Philosophy. And therefore, this Observation would bee translated to the Subject we now speak of: For the more Lustrous the Imagination is, it filleth and fixeth the better. And therefore I conceive, that you shall, in that Experiment, (whereof we spake before,) of Binding of Thoughts, lesse faile, if you tell One, that such an One shall name one of Twenty Men, than if it were One of Twenty Cards. The Experiment of Binding of Thoughts, would be Diversified, and tried to the Full: And you are to note, whether it hit for the most part, though not alwayes.

957

It is good to consider, upon what Things, Imagination hath most Force: And the Rule, (as I conceive,) is, that it hath most Force upon Things, that have the Lightest, and Easiest Motions. And therefore above all, upon the Spiritus of Men: And in them, upon such Affections, as move Lightest; As upon Procuring of Love; Binding of Lust, which is ever with Imagination, upon Men in Feare; Or Men in Irresolution; And the like. Whatsoever is of this kinde would be thorowly enquired. Trialls likewise would bee made upon Plants, and that diligently: As if you should tell a Man, that such a Tree would Dye this yeare; And will him at these and these times, to goe unto it, to see how it thriveth. As for Inanimate Things, it is true, that the Motions of Shuffling of Cards, or Casting of Dice, are very Light Motions: And there is a Folly very usuall, that Gamesters imagine, that some that stand by them, bring them ill Luck. There would be Triall also made, of holding a Ring by a Threed in a Glasse, and telling him that holdeth it, before, that it shall strike so many times against the Side of the Glasse, and no more; Or of Holding a Key between two Mens Fingers, without a Charme, And to tell those that hold it, that at such Name, it shall goe off their Fingers: For these two are Extreme Light Motions. And howsoever I have no opinion of these things, yet so much I conceive to be true; That Strong Imagination hath more Force upon Things Living, Or that have beene Living, than Things meerely Inanimate: And more Force likewise upon Light, and Subtill Motions, than upon Motions Vehement, or Ponderous.

958

It is an usuall Observation, that if the Body of One Murthered, be brought before the Murtherer, the Wounds will bleed a-fresh. Some doe affirme, that the Dead Body, upon the Presence of the Murtherer, hath opened the Eyes; And that there have beene such like Motions, as well where the Partie Murthered hath beene Strangled, or Drowned, as where they have beene Killed by Wounds. It may be, that this participateth of a Miracle, by Gods Just Judgement, who usuallly bringeth Murders to Light: But if it be Naturall, it must be referred to Imagination.

The



The *Tying* of the *Point* upon the day of *Marriage*, to make *Men* Impotent towards their *Wives*, which (as wee have formerly touched,) is so frequent in *Zani*, and *Gascony*, if it be *Naturall*, must be referred to the *Imagination* of *Him* that Ties the *Point*. I conceive it to have the lesse *Affinitie* with *Witchcraft*, because not *Peculiar* Persons onely, (such as *Witches* are,) but any *Body* may doe it.

959

There be many *Things*, that worke upon the *Spirits* of *Man*, by *Secret Sympathy*, and *Antipathy*: The *Vertues* of *Precious Stones*, worn, have beene anciently and generally Received; And curiously assigned to worke severall *Effects*. So much is true; That *Stones* have in them fine *Spirits*; As appeareth by their *Splendour*: And therefore they may worke by *Consensu* upon the *Spirits* of *Men*, to *Comfort*, and *Exhilarate* them. Those that are the best, for that *Effect*, are the *Diamond*, the *Emerald*, the *Jacinth* *Oriental*, and the *Gold-Stone*, which is the *Yellow Topaze*. As for their particular *Proprieties*, there is no *Credit* to be given to them. But it is manifest, that *Light*, above all things, excelleth in *Comforting* the *Spirits* of *Men*: And it is very probable, that *Light* *Varied* doth the same *Effect*, with more *Novelty*. And this is one of the *Causes*, why *Precious Stones* comfort. And therefore it were good to have *Tincted Lanthornes*, or *Tincted Skreenes*, of *Glasse* Coloured into *Greene*, *Blew*, *Carnation*, *Crimson*, *Purple*, &c. And to use them with *Candles* in the *Night*. So likewise to have *Round Glasses*, not onely of *Glasse* Coloured thorow, but with *Colours* laid betweene *Crystals*, with *Handles* to hold in ones *Hand*. *Prismes* are also *Comfortable* *Things*: They have of *Paris* *Worke*, *Looking-Glasses*, bordered with broad *Borders* of small *Crystall*, and great *Counterfeit Precious Stones*, of all *Colours*, that are most *Glorious* and *Pleasant* to behold; Especially in the *Night*. The *Pictures* of *Indian Feathers*, are likewise *Comfortable*, and *Pleasant* to behold. So also *Faire* and *Cleare Pooles* doe greatly comfort the *Eyes*, and *Spirits*; Especially when the *Sunne* is not *Glaring*, but *Overcast*; Or when the *Moone* shineth.

Experiments  
in Consort,  
touching the  
Secret Vertue  
of Sympathy,  
and Antipathy  
960

There be divers *Sorts* of *Bracelets* fit to *Comfort* the *Spirits*; And they be of *Three Intenions*: *Refrigerant*, *Corroborant*; and *Aperient*. For *Refrigerant*, I wish them to be of *Pearle*, or of *Corall*, as is used: And it hath beene noted that *Corall*, if the *Purty* that weareth it be ill disposed, will wax *Pale*: Which I beleve to be true, because otherwise distemper of *Heat* will make *Corall* lose *Colour*. I commend also *Beads*, or little *Plates* of *Lapis Lazuli*; And *Beads* of *Nure*, either alone, or with some *Cordiall Mixture*.

961

For *Corroboration* & *Conservation*, take such *Bodies* as are of *Astringent Quality*, without *Manifest Cold*. I commend *Bead-Amber*, which is full of *Astringion*, but yet is *Viscuous*, and not *Cold*; And is conceived to *Impinguate* those that weare such *Beads*: I commend also *Beads* of *Harts-Horne*, and *Ivory*, which are of the like *Nature*; Also *Orange-Beads*; Also *Beads* of *Lignum Aloës*, Macerated first in *Rose-water*, and *Dried*.

962

For *Opening*, I commend *Beads*, or *Pieces* of the *Roots* of *Cardus Benedictus*: Also of the *Roots* of *Piony* the *Male*; And of *Orris*; And of *Calamus Aromaticus*; And of *Ren*.

963

The *Cramp*, (no doubt) commeth of *Contraction* of *Sinewes*; Which is Manifest, in that it commeth either by *Cold*, or *Driness*; As after *Consumptions*, and *Long Agues*; For *Cold* and *Driness* doe (both of them) *Contract*, and *Corrugate*. Wee see also, that *Chafing* a little above the *Place* in paine, easeth the *Cramp*; Which is wrought by the *Dilatation*, of the *Contracted Sinewes*, by *Heat*. There are in use, for the *Prevention* of the *Cramp*, two *Things*;

964

The



The one *Rings* of *Sea-Horse Teeth*, worne upon the *Fingers*; The other *Bands* of *Greene Perewinkle*, (the *Herb*;) tied about the *Calf* of the *Leg*, or the *Thigh*, &c. where the *Cramp* useth to come. I doe finde this the more strange, because Neither of these have any *Relaxing Vertue*, but rather the *Contrary*. I judge therefore, that their *Working* is rather upon the *Spirits*, within the *Nerves*, to make them strive lesse; Than upon the *Bodily Substance* of the *Nerves*.

I would have *Triall* made of two other *Kindes* of *Bracelets*, for *Comforting* the *Heart*, and *Spirits*; The one of the *Trochisch* of *Vipers*, made into little *Pieces* of *Beads*; For since they doe great *Good Inwards*, (especially for *Pestilent Agues*;) it is like they will be *Effectuall Outwards*; Where they may be applied in greater *Quantity*. There would bee *Trochisch* likewise made of *Snakes*; Whose *Flesh* dried, is thought to have a very *Opening*, and *Cordiall Vertue*. The other is, of *Beads* made of the *Scarlet Powder*, which they call *Kermes*; Which is the *Principall Ingredient* in their *Cordiall Confection Alkermes*: The *Beads* would bee made up with *Amber-Grice*, and some *Pomander*.

It hath beene long received, and confirmed by divers *Trialls*; That the *Root* of the *Male-Piony*, dried, tied to the *Necke*, doth help the *Falling-Sickness*; And likewise the *Incubus*, which we call the *Mare*. The *Cause* of both these *Diseases*, and especially of the *Epilepsie* from the *Stomach*, is the *Grossenesse* of the *Vapours*, which rise and enter into the *Cells* of the *Braine*: And therefore the *Working* is, by *Extreme*, and *Subtill Attenuation*; Which that *Simple* hath. I judge the like to bee in *Castoreum*, *Muske*, *Rew-Seed*, *Agnus Castus Seed*, &c.

There is a *Stone*, which they call the *Bloud-Stone*, which worne is thought to be good for them that *Bleed* at the *Nose*: Which (no doubt) is by *Astriction*, and *Cooling* of the *Spirits*. *Quare*, if the *Stone* taken out of the *Toads Head*, be not of the like *Vertue*; For the *Toad* loveth *Shade*, and *Coolenesse*.

*Light* may be taken from the *Experiment* of the *Horse-Tooth-Ring*, and the *Garland* of *Periwinkle*, how that those things, which assuage the *Sirife* of the *Spirits*, do help diseases, contrary to the *Intention* desired: for in the *Curing* of the *Cramp*, the *Intention* is, to relax the *Sinewes*; But the *Contraction* of the *Spirits*, that they strive lesse, is the best *Help*: So to procure easie *Travailes* of *Women*, the *Intention* is to bring down the *Childe*; But the best *Help* is, to stay the *Comming* down too *Fast*: Whereunto they say, the *Toad-Stone* likewise helpeth. So in *Pestilent Feavers*, the *Intention* is to expell the *Infection* by *Sweat*, and *Evapouration*; But the best *Meanes* to doe it, is by *Nitre*, *Discordium*, and other *Cooler Things*, which doe for a time arrest the *Expulsion*, till *Nature* can doe it more quietly. For as one saith prettily; In the *Quenching* of the *Flame* of a *Pestilent Ague*, *Nature* is like *People* that come to quench the *Fire* of a *House*; which are so busie, as one of them leteith another. Surely, it is an *Excellent Axiome*, and of *Manifold Use*; that whatsoever appeaseth the *Contention* of the *Spirits*, furthereth their *Action*.

The *Writers* of *Naturall Magick*, commend the *Wearing* of the *Spoile* of a *Snake*, for *Preserving* of *Healib*. I doubt it is but a *Conceit*; For that the *Snake* is thought to renew her *Youth*, by *Casting* her *Spoile*. They might as well take the *Beake* of an *Eagle*, or a *Peece* of a *Harts-Horne*, because those *Renue*.

It hath beene *Anciently Received*, (For *Pericles* the *Athenian* used it,) and it is yet in use, to weare little *Bladders* of *Quick-Silver*, or *Tablets* of *Arsenicke*, as *Preservatives* against the *Plague*: Not as they conceive, for any *Comfort* they yeeld to the *Spirits*, but for that being *Poysons* themselves, they draw the *Venome* to them, from the *Spirits*.

Vide



Vide the Experiments 95.96. and 97. touching the *Severall Sympathies*, and *Antipathies*, for *Medicinall Use*.

971

It is said, that the *Guts* or *Skin* of a *Wolfe* being applyed to the *Belly*, doe cure the *Cholicke*. It is true, that the *Wolfe* is a *Beast* of great *Edacitie* and *Digestion*; And so, it may be, the *Parts* of him comfort the *Bowels*.

972

We see *Scare-Crowes*, are set up to keep *Birds* from *Corn*, and *Fruit*; It is reported by some, that the *Head* of a *Wolfe*, whole, dried, and hanged up in a *Dove-House*, will scare away *Vermine*; Such as are *Weasils*, *Polcats*, and the like. It may be, the *Head* of a *Dog* will doe as much; For those *Vermine* with us, know *Dogs* better than *Wolves*.

973

The *Brains* of some *Creatures*, (when their *Heads* are roasted) taken in *Wine*, are said to strengthen the *Memory*: As the *Brains* of *Hares*; *Brains* of *Hens*; *Brains* of *Deeres*, &c. And it seemeth to bee incident to the *Brains* of those *Creatures*, that are *Fearfull*.

974

The *Ointment*, that *Witches* use, is reported to be made, of the *Fat* of *Children*, digged out of their *Graves*; Of the *Juyces* of *Smallage*, *Wolfe-Bane*, and *Cinquefoile*; Mingled with the *Meale* of fine *Wheat*. But I suppose, that the *Soporiferous Medicines* are likest to doe it; Which are *Henbane*, *Hemlocke*, *Mandrake*, *Moone-Shade*, *Tobacco*, *Opium*, *Saffron*, *Poplar-Leaves*, &c.

975

It is reported by some, that the *Affections* of *Beasts*, when they are in *Strength*, doe adde some *Vertue*, unto *Inanimate Things*; As that the *Skin* of a *Sheep*, devoured by a *Wolfe*, moveth *Itching*; That a *Stone* bitten by a *Dog* in *Anger*, being throwne at him, drunke in *Powder*, provoketh *Choler*.

976

It hath beene observed, that the *Diet* of *Women* with *Childe*, doth worke much upon the *Infant*; As if the *Mother* eat *Quinces* much, and *Coriander-Seed*, (the *Nature* of both which is to repress and stay *Vapours*, that ascend to the *Braine*.) it will make the *Childe* *Ingenious*: And on the contrarie side, if the *Mother* eat (much) *Onions*, or *Beanes*, or such *Vapourous Food*; Or drinke *Wine*, or *Strong Drinke*, immoderately; Or *Fast* much; Or bee given to much *Musing*; (All which send, or draw *Vapours* to the *Head*.) It endangereth the *Childe* to become *Lunaticke*, or of *Imperfect Memory*: And I make the same *Judgement* of *Tobacco*, often taken by the *Mother*.

977

The *Writers* of *Naturall Magick* report, that the *Heart* of an *Ape*, wortie neare the *Heart*, comforteth the *Heart*, and increaseth *Audacity*. It is true, that the *Ape* is a *Merry* and *Bold Beast*. And that the same *Heart* likewise of an *Ape* applyed to the *Necke*, or *Head*, helpeth the *Wit*; And is good for the *Falling-Sicknesse*: The *Ape* also is a *Witty Beast*, and hath a *Drie Braine*; Which may be some *Cause* of *Attenuation* of *Vapours* in the *Head*. Yet it is said to move *Dreames* also. It may be the *Heart* of a *Man* would doe more, but that it is more against *Mens* mindes to use it; Except it bee in such as weare the *Reliques* of *Saints*.

978

The *Flesh* of a *Hedge-Hog*, *Dressed*, and *Eaten*, is said to be a great *Drier*: It is true, that the *Juyce* of a *Hedge-Hog*, must needs bee *Harsh*, and *Drie*, because it putteth forth so many *Prickles*: For *Plants* also, that are full of *Prickles*, are generally *Dry*: As *Briars*, *Thornes*, *Berberries*: And therefore the *Ashes* of an *Hedge-Hog* are said to be a great *Desiccative* of *Fistula's*.

979

*Mummy* hath great force in *Stanching* of *Bloud*; which, as it may be ascribed to the *Mixture* of *Balmes*, that are *Glutinous*; So it may also partake of a *Secret Propriety*; In that the *Bloud* draweth *Mans Flesh*. And it is approved, that the *Mosse*, which groweth upon the *Skull* of a *Dead Man*, unburied, will stanch *Bloud* Potently. And so doe the *Dregs*, or *Powder* of *Bloud*, severed from the *Water*, and *Dried*.

980



981

It hath beene practised, to make *white Swallows*, by *Anointing* of the *Egs* with *Oyle*. Which *Effect* may be produced, by the *Stopping* of the *Pores* of the *Shell*, and making the *Iuyce*, that putteth forth the *Feathers* afterwards, more *Penurious*. And it may be, the *Anointing* of the *Egs*, will be as *Effectuall*, as the *Anointing* of the *Body*; Of which *Vide* the *Experiment* 93.

982

It is reported, that the *white* of an *EGge*, or *Bloud*, mingled with *Salt-water*, doth gather the *Saltnesse*, and maketh the *water* sweeter. This may be by *Adhesion*; As in the 6. *Experiment* of *Clarification*: It may be also, that *Bloud*, and the *white* of an *EGge*, (which is the *Matter* of a *Living Creature*,) have some *Sympathy* with *Salt*: For all *Life* hath a *Sympathy* with *Salt*. Wee see that *Salt*, laid to a *Cut Finger*, healeth it; So as it seemeth *Salt* draweth *Bloud*, as well as *Bloud* draweth *Salt*.

983

It hath beene anciently received, that the *Sea Hare*, hath an *Antipathy* with the *Lungs*, (if it commeth neare the *Body*,) and erodeth them. Whereof the *Cause* is conceived to be, a *Qualitie* it hath of *Heating* the *Breath*, and *Spirits*; As *Cantharides* have upon the *Watry Parts* of the *Body*; As *Urine* and *Hydropicall water*. And it is a good *Rule*, that whatsoever hath an *Operation* upon certaine *Kindes* of *Matters*, that, in *Mans Body*, worketh most upon those *Parts*, wherein that kinde of *Matter* aboundeth.

984

Generally, that which is *Dead*, or *Corrupted*, or *Excerned*, hath *Antipathy* with the same *Thing*, when it is *Alive*, and when it is *Sound*; And with those *Parts* which doe *Excerne*: As a *Carkasse* of *Man* is most *Infectious*, and *Odi-ous* to *Man*. A *Carrion* of an *Horse* to an *Horse*, &c. *Purulent Matter* of *wounds*, and *Ulcers*, *Carbuncles*, *Pocks*, *Scabs*, *Leprosie*, to *Sound Flesh*; And the *Excrement* of every *Species* to that *Creature* that *Excerneth* them. But the *Excrements* are lesse *Pernicious* than the *Corruptions*.

985

It is a *Common Experience*, that *Dogs* know the *Dog-Killer*; When as in times of *Infection*, some *Petty Fellow* is sent out to kill the *Dogs*; And that, though they have never seene him before, yet they will all come forth, and barke, and flie at him.

986

The *Relations* touching the *Force* of *Imagination*, and the *Secret Instincts* of *Nature*, are so uncertaine, as they require a great deale of *Examination*, ere we conclude upon them. I would have it first thorowly inquired, whether there be any *Secret Passages* of *Sympathy*, between *Persons* of neare *Bloud*; As *Parents*, *Children*, *Brothers*, *Sisters*, *Nurse-Children*, *Husbands*, *Wives*, &c. There be many *Reports* in *Historie*, that upon the *Death* of *Persons* of such *Neareness*, *Men* have had an inward *Feeling* of it. I my *Self* remember, that being in *Paris*, and my *Father* dying in *London*, two or three dayes before my *Fathers* death, I had a *Dream*, which I told to divers *English Gentlemen*; That my *Fathers House*, in the *Counirey*, was *Plaistered* all over with *Blacke Mortar*. There is an *Opinion* abroad, (whether idle or no I cannot say,) That loving and kinde *Husbands*, have a *Sense* of their *Wives* breeding *Childe*, by some *Accident* in their owne *Bodie*.

987

Next to those that are *Neare* in *Bloud*, there may be the like *Passage*, and *Instincts* of *Nature*, betweene great *Friends*, and *Enemies*: And sometimes the *Revealing* is unto *Another Person*, and not to the *Partie* Himselfe. I remember *Philippus Comminens*, (a grave *Writer*,) reporteth; That the *Arch-Bishop* of *Vienna*, (a *Reverend Prelate*,) said (one day) after *Masse*, to *King Lewis* the eleventh of *France*; Sir, your *Mortall Enemy* is dead; What time *Duke Charles* of *Burgundy* was *Slain*, at the *Battell* of *Granson*, against the *Switzers*. Some triall also would be made, whether *Pact* or *Agreement* doe any thing; As if two *Friends* should agree, that such a *Day* in every *Week*, they

being



being in farre *Distant Places*, should *Pray* one for Another; Or should put on a *Ring*, or *Tablet*, one for anothers Sake; Whether if one of them should breake their *Vow* and *Promise*, the other should have any *Feeling* of it, in *Absence*.

If there be any *Force* in *Imaginations* and *Affections* of *Singular Persons*; It is Probable the *Force* is much more in the *Ioynt Imaginations* and *Affections* of *Multitudes*: As if a *Victory* should be won, or lost, in *Remote Paris*, whether is there not some *Sense* thereof, in the *People* whom it concerneth, Because of the great *Ioy*, or *Griefe*, that many *Men* are posselt with at once? *Pius Quintus*, at the very time, when that Memorable *Victory* was won, by the *Christians*, against the *Turkes*, at the *Navall Battell* of *Lepanto*, being then hearing of *Causes* in *Consistory*, brake off suddenly, and said to those about him, *It is now more time we should give thanks to God, for the great Victory he hath granted us, against the Turks*; It is true, that *Victory* had a *Sympathy* with his *Spirit*; For it was meerely his *Worke*, to conclude that *League*. It may be, that *Revelation* was *Divine*; But what shall we say then, to a Number of *Examples*, amongst the *Grecians*, and *Romans*? Where the *People*, being in *Theaters* at *Plays*, have had *Newes* of *Victories*, and *Overthrowes*, some few dayes, before any *Messenger* could come.

It is true, that that may hold in these Things, which is the generall *Root* of *Superstition*: Namely, that *Men* observe when *Things Hit*, and not when they *Miss*: And commit to *Memorie* the one, and forget and passe over the other. But touching *Divination*, and the *Misgiving* of *Mindes*, we shall speake more, when we handle in generall the *Nature* of *Mindes*, and *Soules*, and *Spirits*.

We have given formerly some *Rules* of *Imagination*; And touching the *Fortifying* of the Same. We have set downe also some few *Instances*, and *Directions*, of the *Force* of *Imagination*, upon *Beasts*, *Birds*, &c. upon *Plants*; And upon *Inanimate Bodies*: Wherin you must still observe, that your *Trialls* be upon *Subtill* and *Light Motions*, and not the contrary; For you will sooner, by *Imagination*, binde a *Bird* from *Singing*, than from *Eating*, or *Flying*: And I leave it to every *Man*, to choose *Experiments*, which himselfe thinketh most *Commodious*; Giving now but a few *Examples* of every of the *Three Kindes*.

Use some *Imaginant*, (observing the *Rules*, formerly prescribed,) for *Binding* of a *Bird* from *Singing*; And the like of a *Dogge* from *Barking*. Trie also the *Imagination* of some, whom you shall accommodate with things to fortifie it, in *Cocke-Fights*, to make one *Cocke* more *Hardy*, and the other more *Cowardly*: It would be tried also, in *Flying* of *Hawkes*; Or in *Coursing* of a *Deere*, or *Hart*, with *Grey-Hounds*; Or in *Horse-Races*; And the like *Comparative Motions*: For you may sooner by *Imagination*, quicken or slacke a *Motion*, than raise or cease it; As it is easier to make a *Dogge* goe slower, than to make him stand still that he may not runne.

In *Plants* also, you may trie the *Force* of *Imagination*, upon the *Lighter Sort* of *Motions*: As upon the *Sudden Fading*, or *Lively Comming up* of *Herbs*; Or upon their *Bending* one way, or other; Or upon their *Closing*, and *Opening*; &c.

For *Inanimate Things*, you may trie the *Force* of *Imagination*, upon *Staying* the

988

989

990

991

992



the *Working* of Beere, when the *Barme* is put in; Or upon the *Comming* of Butter, or Cheese, after the *Cherming*, or the *Rennet* be put in.

993

It is an Ancient Tradition, everie where alleaged, for Example of Secret Proprieties and Influxes, that the *Torpedo Marina*, if it be touched with a long Sticke, doth stupifie the Hand of him that toucheth it. It is one degree of *Working* at Distance, to work by the Continuance of a Fit Medium; As sound will be conveyed to the Eare, by striking upon a Bow-string, if the Horne of the Bow be held to the Eare.

994

The Writers of *Naturall Magick*, doe attribute much to the *Vertues*, that come from the Parts of *Living Creatures*; So as they bee taken from them, the *Creatures* remaining still alive: As if the *Creature* still living did infuse some *Immateriate Vertue*, and *Vigour* into the Part Severed. So much may be true; that any Part, taken from a *Living Creature*, newly *Slaine*, may bee of greater force, than if it were taken from the like *Creature*, dying of it Selfe, because it is fuller of Spirit.

995

Triall would be made, of the like Parts of *Individualls*, in *Plants*, and *Living Creatures*; As to cut off a Stock of a Tree; And to lay that, which you cut off, to *Putrifie*, to see whether it will Decay the Rest of the Stocke: Or if you should cut off part of the Taile, or Legge of a Dogge, or a Cat, and lay it to *Putrifie*, and so see whether it will Fester, or keepe from Healing, the Part which remaineth.

996

It is received, that it helpeth to Continue Love, if one weare a Ring, or a Bracelet of the Haire of the Parry Beloved. But that may be by the Exciting of the Imagination: And perhaps a Glove, or other like Favour, may as well doe it.

997

The Sympathie of *Individualls*, that have beene Entire, or have Touched, is of all others the most Incredible: Yet according unto our faithfull Manner of Examination of Nature, we will make some little mention of it. The Taking away of Warts, by Rubbing them with Somewhat that afterwards is put to waste, and consume, is a Common Experiment: And I doe apprehend it the rather, because of mine owne Experience. I had, from my Childhood, a Wart upon one of my Fingers: Afterwards when I was about Sixteen Yeares old, being then at Paris, there grew upon both my Hands a Number of Warts, (at the least an hundred,) in a Months space. The English Embassadors Lady, who was a Woman farre from Superstition, told me, one day; She would helpe me away with my Warts: Whereupon she got a Peece of Lard, with the Skin on, and rubbed the Warts all over with the Fat Side; And amongst the rest, that Wart which I had had from my Childhood; Then she nailed the Peece of Lard, with the Fat towards the Sunne, upon a Poast of her Chamber window, which was to the South. The Successe was, that within five weekes space, all the Warts went quite away: And that Wart, which I had so long endured, for Company. But at the rest I did little marvell, because they came in a Short time, and might goe away in a Short Time againe: But the Going away of that, which had staid so long, doth yet stick with me. They say the like is done by the Rubbing of Warts with a Green Elder Sticke, and then Burying the Sticke to Rot in Muck. It would be tried, with Cornes, and Weens, and such other Excreescences. I would have it also tried, with some Parts of *Living Creatures*, that are nearest the Nature of Excreescences; As the Combs of Cocks, the Spurres of Cocks, the Hornes of Beasts, &c. And I would have it tried both wayes; Both by Rubbing those Parts with Lard, or Elder, as before, And by Cutting off some Peece of those Parts, and laying it to Consume. To see whether it will Worke any Effect, towards the Consumption of that Part, which was once Ioynd with it. It



It is constantly Received, and Avouched, that the *Anointing* of the *Weapon*, that maketh the *Wound*, will heale the *Wound* it selfe. In this *Experiment*, upon the Relation of *Men of Credit*, (though my selfe, as yet, am not fully inclined to beleve it,) you shall note the *Points* following, First, the *Ointment*, wherewith this is done, is made of Divers *Ingredients*; whereof the *Strangest* and *Hardest* to come by, are the *Mosse* upon the *skull* of a *dead Man*, *Unburied*; And the *Fats* of a *Boare*, and a *Beare* killed in the *Act* of *Generation*. These two last I could easily suspect to be prescribed as a *Starting Hole*; That if the *Experiment* proved not, it might be pretended, that the *Beasts* were not killed in the due *Time*; For as for the *Mosse*, it is certain, there is great *Quantity* of it in *Ireland*, upon *Staine Bodies*, laid on *Heaps*, *Unburied*. The other *Ingredients* are, the *Bloud-Stone* in *Powder*, and some other *Things*, which seeme to have a *Vertue* to *Stanch Bloud*; As also the *Mosse* hath. And the *Description* of the whole *Ointment* is to be found in *Chymicall Dispensatorie* of *Crollius*. Secondly, the same *Kinde* of *Ointment*, applied to the *Hurt* it selfe, worketh not the *Effect*; but onely applied to the *Weapon*. Thirdly, (which I like well) they doe not observe the *Confecting* of the *Ointment*, under any certaine *Constellation*; which commonly is the *Excuse* of *Magickall Medicines*, when they faile, that they were not made under a sit *Figure* of *Heaven*. Fourthly, it may bee applied to the *Weapon*, though the *Party Hurt* be at great *Distance*. Fifthly, it seemeth the *Imagination* of the *Partie*, to be *Cured*, is not needfull to *Concurre*; For it may be done, without the *Knowledge*, of the *Partie Wounded*; And thus much hath been tried, that the *Ointment* (for *Experiments* sake,) hath been wiped off the *Weapon*, without the *Knowledge* of the *Partie Hurt*, and presently the *Partie Hurt*, hath beene in great *Rage* of *Paine*, till the *Weapon* was *Reannointed*. Sixtly, it is affirmed, that if you cannot get the *Weapon*, yet if you put an *Instrument* of *Iron*, or *Wood*, resembling the *Weapon*, into the *Wound*, whereby it bleedeth, the *Anointing* of that *Instrument* will serve, and worke the *Effect*. This I doubt should be a *Device*, to keepe this strange *Forme* of *Cure*, in *Request*, and *Use*; Because many times you cannot come by the *Weapon* it selfe, Seventhly, the *Wound* must be at first *Washed* cleane, with *White Wine*, or the *Parties owne Water*; And then bound up close in *Fine Linnen*, and no more *Dressing* renewed, till it be whole. Eighthly, the *Sword* it selfe must be *wrapped up Close*, as farre as the *Ointment* goeth, that it taketh no *Wind*. Ninthly, the *Ointment*, if you wipe it off from the *Sword*, and keepe it, will *Serve* againe; and rather *Increase* in *Vertue*, than *Diminish*. Tenthly, it will *Cure* in farre *shorter Time*, than *Ointment* of *wounds* commonly doe. Lastly, it will *Cure* a *Beast*, as well as a *Man*; which I like best of all the rest, because it subjecteth the *Matter*, to an *Easie Triall*.

I Would have *Men* know, that though I reprehend, the *Easie Passing over*, of the *Causes* of *Things*, by Ascribing them to *Secret* and *Hidden Vertues*, and *Proprieties*; (For this hath arrested, and laid asleepe, all true *Enquiry*, and *Indications*;) yet I doe not understand, but that in the *Practicall Part* of *Knowledge*, much will be left to *Experience*, and *Probation*, whereunto *Indication* cannot so fully reach: And this not onely in *Specie*, but in *Individuo*. So in *Physicke*, if you will cure the *Taundies*, it is not enough to say, that the *Medicine* must not be *Cooling*; For that will hinder the *Opening* which the *Disease* requireth: That it must not be *Hot*; For that will exasperate *Choler*: That it must goe to the *Gall*; For there is the *Obstruction* which causeth the *Disease*, &c. But you must receive from *Experience*, that *Powder* of *Chamæpitys*,

998

Experiment  
Solitary, touch-  
ing Secret  
Proprieties.  
999

Experiment  
Solitary, touch-  
ing Secret  
Proprieties.  
999



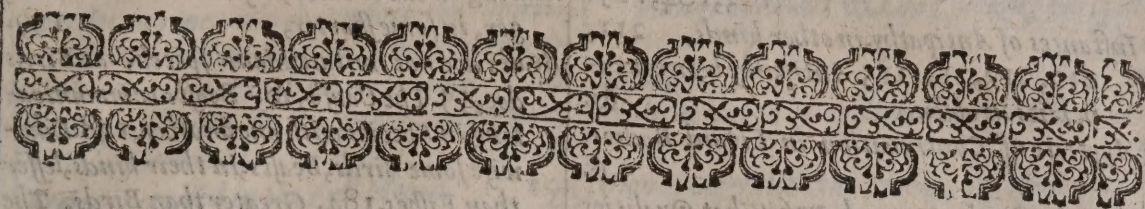
or the like, drunke in *Beere*, is good for the *Iaundies*: So againe, a wise *Physitian* doth not continue still the same *Medicine*, to a *Patient*; But he will vary, if the first *Medicine* doth not apparently succeed: For of those *Remedies*, that are good for the *Iaundies*, *Stone*, *Agues*, &c. that will doe good in one *Body*, which will not do good in another; According to the Correspondence the *Medicine* hath to the *Individuall body*.

Experiment  
Solitary, touch-  
ing the Gene-  
rall Sympathy of  
Mens Spirits.  
1000

**T**He Delight which Men have in *Popularitie*, *Fame*, *Honour*, *Submission*, and *Subjection* of other Mens *Mindes*, *Wills*, or *Affections* (although these Things may be desired for other *Ends*), seemeth to be a Thing, in it selfe, without Contemplation of Consequence, Gratefull and agreeable to the Nature of Man. This Thing (surely) is not without some Signification; as if all *Spirits* and *Soules* of Men, came forth out of one *Divine Limbus*; Else why men be so much affected with that, which others thinke, or say? The best Temper of *Mindes* desireth *Good Name*, and *True Honour*: The Lighter, *Popularitie*, and *Applause*; The more depraved: *Subjection*, and *Tyranny*; As is seene in great *Conquerours*, and *Troublers* of the world: And yet more in *Arch-Hereticks*; for the Introducing of new *Doctrines*, is likewise an *Affetation* of *Tyranny*, over the *Understandings*, and *Beleeves* of Men.

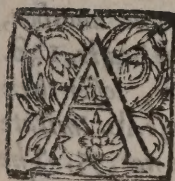
## A TABLE





# A Table of the Chiefe Matters contained in these Centuries.

A.



**A**cceleration of Time in Works of Nature, 67. In Clarification of Liquor, 68. In severall Maturations, 69. As of Fruits, ib. Of Drinks, ib. Impostumes and Vlcers, ib. Of Mettals, ib. Of Clarification in Wine, 165. Acceleration of Putrefaction, 73. Acceleration of Birth, 78. Of Growth or Stature, ib. Three Meanes of it. ibid. Acceleration of Germination, 89. By three Meanes; viz. Mending the Nourishment, 90. Comforting the Spirits of the Plant, ib. Easie Comming to the Nourishment, ib. 91. Severall Instances thereof. 89, 90, 91. Aches in Mens Bodies foreshew Raine. 176. Egypt scarce in Raine, 161. Egyptian Con- serving of Bodies, 163. Their Mummies, ib. Equinoctial more tolerable for Heat, than the Zones, 87. Three Causes thereof. ib. Ethiopes. 88. Etna. 165. Affectation of Tyrannie over Mens Under- standings, and Beliefes. 218. Affections of Beasts impressed upon Inanimate Things. 213. Agarick. 116. 131. Aire turned into a water, 6. By foure severall Wayes, ib. Instances tending therto, 20, 21. converted into a Dense Body, a Rarity in Nature. 7. Hath an Antipathy with Tangible Bodies, 21. Converted into Water by Re- percussion from hard Bodies, ib. Aire turned into Water, by the same meanes that Ice, ib. Congealing of Aire, 80. Aire Condensed into Weight. 156. Aire pent the Cause of Sounds, 32, 33, 34. E-

ruptions thereof cause Sounds, ib. Aire not  
always necessary to Sounds. 36  
Aire excluded, in some Bodies, prohibiteth Pu-  
trefaction, 75. In some causeth it, 76. The  
causes of each, ib. Aire compressed & blown,  
prohibiteth Putrefaction. 77  
Aires wholsome how found out, 164. The Pu-  
trefaction of Aire to be discerned aforehand,  
173. Aires good to recover Consumptions,  
204. Aire healthfull within doores how pro-  
cured. ib.  
Aire, and Fire, foreshewes winds. 274  
Aire, 21. The Causes of Heat and Cold in it, ib.  
Hath some Degree of Light in it. ib.  
Aire poisoned by Art. 200  
Alchymists. 71  
Alexanders Body preserved till Casars time. 163  
Aliments changed good. 18  
Alleyes close gravelled what they bring forth. 117  
All night. 83  
Almond Butter, for Nourishing sicke Bodies,  
better than Cullices. 13  
Alterations of Bodies. 179  
Altering the Colours, of Haires, and Feathers. 183  
Amber-Smell. 204  
Anger, 150. The Impression thereof, 151. Cau-  
seth the eyes to look red, 189. The Cause. ib.  
Animate and Inanimate wherein they dif-  
fer. 125  
Annihilation not possible in nature. 28  
Anointing of the Weapon. 217  
Annuall Herbs. 120  
Anthonius his Genius weake before Augustus. 205  
Antipathy and Sympathy, 25. Of Plants. 101,  
102



## A Table of the Chiefe Matters

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
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| <p style="text-align: right;">102, 103, 104, 105.</p> <p>Instances of Antipathy, in other kinds, 211,<br/>212, 213, 214, 215. Antipathy betweene e-<br/>nemies in absence. ib.</p> <p>Appetite of Continuation in Liquid Bodies.<br/>5, 6.</p> <p>Appetite in the Stomach, 176 What Qualities<br/>provoke it, ib. Four Causes thereof. ib.</p> <p>Apple enclosed in Wax. for speedy Ripening,<br/>70, 71. Hanged in smoake, ib. Covered in<br/>Lime, and Ashes, ib. Covered with Crabs,<br/>and Onions, ib. Apple in Hay, and Straw, ib.</p> <p>In a close Box, ib. Apple rowled, ib. Apple, in<br/>part, cut besmeared with Sacke. ib.</p> <p>Apples-Cions grafted on the Stocke of a Cole-<br/>wort. 97</p> <p>Apple-Trees, some of them, bring forth a sweet<br/>Mosse. 114</p> <p>Aqua fortis dissolving Iron. 166</p> <p>Arch-Bishop of Vienna his Revelation to Lew-<br/>is the Eleventh. 214</p> <p>Arrowes with Woodden Heads sharpened,<br/>pierce Wood sooner than with Iron Heads. 148</p> <p>Artichokes made lesse prickly. 98</p> <p>Art of Memorie. 210</p> <p>Ashes in a Vessell will not admit Equall Quan-<br/>tity of Water, as in the Vessell Emptie, 10.</p> <p>Ashes an excellent Compost. 123</p> <p>Aspe causeth Easie Death. 132</p> <p>Assimilation in Bodies Inanimate, 24. In Ve-<br/>getables. ib. 79, 179</p> <p>Astriction prohibiteth Putrefaction. 75</p> <p>Attraction by Similitude of Substance. 148;<br/>191</p> <p>Audibles mingle in the Medium, which Visi-<br/>bles doe not, 53. The Cause thereof, ib. Seve-<br/>rall Consents of Audibles and Visibles, 58,<br/>59. Severall Dissents of them, 60, 61. Audi-<br/>bles and Visibles. 204</p> <p>Authority strengtheneth Imagination. 208</p> | <p>Bearing in the Wombe, in some Creatures, lon-<br/>ger, in some shorter, 159.</p> <p>Beasts doe not imitate Mans speech, as Birds<br/>doe, 55. The Cause, ib. Beasts communica-<br/>ting in Species with one another, 138. Like-<br/>wise some Birds, Beasts, in their kinds, lesse<br/>than Fishes, 184. Greater than Birds. The<br/>Cause. ib.</p> <p>Beasts, that yeeld the Taste, or Vertue of the<br/>Herb they feed on. 104</p> <p>Beasts foreshew Raine. 175</p> <p>Capon Beere how made, 13. A very nourishing<br/>Drinke. ib.</p> <p>Bees Humming an Vnequall Sound. 43</p> <p>Birds have another manner in their Quick-<br/>ning, than Men, or Beasts, 25. Birds com-<br/>municating in Species with one another,<br/>138. Swifter in motion than Beasts, 138.<br/>The Cause, ib. In their kinds, lesse than<br/>Beasts, or Fishes, 184. The Cause, ib. Imitate<br/>Mans speech, which Beasts doe not, 55. The<br/>Cause. ib.</p> <p>Birth of Living-Creatures. 78</p> <p>Blacke the best Colour in plums. 509</p> <p>Bleare-Eyes Infectious. 202</p> <p>Bleeding of the Body, at the approach of the<br/>Murderer. 210</p> <p>Bloud, five Meanes of Stanching it. 18</p> <p>Bloud draweth Salt. 214</p> <p>Bloud of the Cuttle-Fish. 156</p> <p>Bloud-stone. 212</p> <p>Blowes and Bruises induce swelling, 187. The<br/>Cause. ib.</p> <p>Blushing causeth Rednesse in the Eares, not in<br/>the Eyes, as Anger doth, 189. The Cause of<br/>each. ib.</p> <p>Boaring an hole thorow a Tree helpeth it. 94</p> <p>Body brittle stricken, 3. Bodies naturall, most<br/>of them, have an Appetite of admitting o-<br/>thers into them, 169, Except Flame, ib. Bo-<br/>dies unperfectly mixt. 178</p> <p>Bodies in Nature, that give no Sounds, and<br/>that give Sounds. 32, 33, 34</p> <p>Bodies, to which Wine is hurtfull, and to which<br/>good. 153</p> <p>Bodies conserved a long time. 162, 163</p> <p>Boldnesse and industry, the Power of them in<br/>Ciwill Businesse. 190, 205</p> <p>Boletus. 131</p> <p>Bolus Arminius. 147</p> <p>Bones, 141, 157. The most sensible of Cold. 141.<br/>In what Fishes none, 157. One in the Heart<br/>of Stag. ib.</p> |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

### B.

|                                                                                                                                                                                                                                                                                                                                                                                |                |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|
| <p><b>B</b>Agge growing in the Fields. 115</p> <p>Barrel empty, knocked, said to give a Dia-<br/>pason, to the same Barrell full. 45</p> <p>Barrennesse of Trees, the Cause. 100</p> <p>Bassile turned into Wilde Thyme. 111</p> <p>Basiliske. 202</p> <p>Bathing the Body, 156. Would not bee Health-<br/>full for us, if it were in use, ib. For the Turks<br/>good. ib.</p> | <p>Boyling</p> |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|



contained in these Centuries.

Boyling causeth Graines to swell in difference, 185  
 Bracelets worne, which comfort the Spirits, 212. Their three severall operations, ib. Other Bracelets for the same purpose. ib.  
 Braines of some Beasts strengthen the Memory. 213  
 Braine increased in the Full Moone. 193  
 Brasse Sanative of Wounds. 166  
 Brasse-Plates assuage Swelling. 187  
 Breath held helpeth Hearing, 62. The Cause. ib.  
 Brier-Bush. 117  
 Bringing forth many at a Birth, and but one, 160. The Cause of each, ib.  
 Burning Glasses-rare. 34  
 Burning some Vegetables upon the Ground enricheth it. 122  
 Burrage Lease infused. 4  
 C.  
 C. Ake growing on the side of a dead Tree. 139  
 Calamitas. 137  
 Candles of severall Mixtures, 82. Of severall wickes, 83. Laid in Bran for lasting. ib.  
 Cantharides wheresoever applyed affecteth the Bladder, 25, 214. The Fly Cantharides, 153. Of what substance they are bred. ib.  
 Carrying off forraine Roots safe. 128  
 Cassia. ib.  
 Casting of the skin, or shell, 154. The Creatures that cast either. ib.  
 Caterpillars. 153  
 Cements that grow hard. 183  
 Chalke a good Compost, 122, 123. Good for Pasture, as well as for Arable. ib.  
 Chameleons, 80. Their nourishment, ib. A fond Tradition of them. ib.  
 Chamoletted Paper. 156  
 Change in Medicines, and Aliments, good, 18. The Cause why. ib.  
 Charcoale vapour, in a close Roome mortall. 202  
 Charmes. 208  
 Cheape Fuell. 164  
 Children borne in the seaventh Moneth, vitall, In the eighth, not, 78. The Cause why, ib. Overmuch Nourishment ill for children, ib. Dry Nourishment hurtfull, ib. Nourishment

of an opening nature good for them, ib. Sitting much, hurtfull for them, ib. Cold Things hurtfull, ib. Long sucking hurtfull. b.  
 Chineses. 71  
 Cholicke cured by application of Wolfes guts. 213  
 Cions over-ruleth the Stocke, 93. Must bee superiour to it, 99. Cions regrafted. 97  
 Cinnamon, 128. The Properties of that Tree. ib.  
 Citron grafted on a Quince. 110  
 Clammy Bodies. 64, 65  
 Clarifying of Liquours by Adhesion, 2. Of Water running. ib.  
 Clarification of Liquours, 67. Three Causes therof, ib. 80. Clarification of them by Separation, ib. By even distribution of the Spirits, ib. By refining the Spirit, ib. Severall Instances of Clarification, ib. 68. Clarification of Drinks, ib. 69. Of Wine. 137  
 Clarification. 162  
 Cloves attractive of Water. 21  
 Coasting of Plants. 99  
 Coffa, a Berry making Drinke in Turkey. 155  
 Cold, 19. Production of it a very Noble Worke, ib. Seaven Meanes to produce it, ib. 20. Primum Frigidum the Earth, 19. Transitive into Bodies adjacent as well as Heat, ib. All Tangible Bodies of themselves cold, ib. Densitie Cause of Cold, ib. Quicke Spirit in a Cold Body encreaseth Cold, ib. 20. Chasing away of the warme Spirits Encrease of Cold, ib. Exhaling of the Warme Spirits doth the like, ib. Cold prohibiteth Putrefaction, 75. Irritateth Flame. 83  
 Cold having mortified any Part, how to helpe it. 166  
 Coleworts furthered in their Growth by Seaweed, 96. By being watred with Salt Water, 98. Hurt neighbour Plants. 101  
 Colliquation. 73  
 Coloquintida. 202  
 Colouration of Flowres, 108. Colours of Flowres different from the same seed, 109. Colours of Herbs. ib.  
 Colours vanish not by degrees, as Sounds doe, 51. The Causes thereof, ib. Colours of Metall Orient in their Dissolutions, 64. The Causes. ib.  
 Comforting of the Spirits of Men by severall Things. 211  
 Com-



## A Table of the Chiefe Matters

|                                                                                                                                                                                                                                                                                                                                                                                                                 |  |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| <i>Composts to enrich Ground,</i> 122, 123, 124.                                                                                                                                                                                                                                                                                                                                                                |  |
| <i>The Ordering of them for severall Grounds,</i> 222. <i>Six Kinds of them.</i> ib.                                                                                                                                                                                                                                                                                                                            |  |
| <i>Compound-Fruits,</i> 100. <i>How they may be made.</i> ibid.                                                                                                                                                                                                                                                                                                                                                 |  |
| <i>Compression in solide Bodies,</i> 2. <i>Cause of all violent Motion,</i> 3. <i>Not hitherto inquired,</i> ib. <i>Worketh first in round, then in progresse,</i> ib. <i>Easily discernable in Liquours, in solide Bodies not,</i> ib. <i>Compression in a brittle Body,</i> ib. <i>In Powder in Shot,</i> ib. <i>To a preternatural Extent.</i> 16. <i>In Sounds,</i> ib. <i>Compression of Liquours.</i> 187 |  |
| <i>Concoction,</i> 179. <i>The Word lesse restrained then formerly,</i> ib. <i>Not the Worke of Heat alone,</i> ib. <i>The two Periods of it.</i> ib.                                                                                                                                                                                                                                                           |  |
| <i>Concords in Musick,</i> 30                                                                                                                                                                                                                                                                                                                                                                                   |  |
| <i>Concretion of Bodies,</i> 181. <i>Dissolved by the Contrary.</i> ib.                                                                                                                                                                                                                                                                                                                                         |  |
| <i>Condensing Medicines to releewe the Spirits.</i> 155                                                                                                                                                                                                                                                                                                                                                         |  |
| <i>Condensing of aire into Weight.</i> 156                                                                                                                                                                                                                                                                                                                                                                      |  |
| <i>Congeling of Aire.</i> 80                                                                                                                                                                                                                                                                                                                                                                                    |  |
| <i>Conservation of Bodies long time,</i> 162, 163. <i>The Causes and helpe thereof.</i> ib.                                                                                                                                                                                                                                                                                                                     |  |
| <i>Conservation of Bodies in Quick-silver.</i> 168                                                                                                                                                                                                                                                                                                                                                              |  |
| <i>Consistences of Bodies.</i> 180                                                                                                                                                                                                                                                                                                                                                                              |  |
| <i>Consumptions in what Aires recovered.</i> 204.                                                                                                                                                                                                                                                                                                                                                               |  |
| <i>Contiguous Things once, their operations.</i> 201                                                                                                                                                                                                                                                                                                                                                            |  |
| <i>Coppice-Woods hastned.</i> 93                                                                                                                                                                                                                                                                                                                                                                                |  |
| <i>Corall.</i> 126, 165                                                                                                                                                                                                                                                                                                                                                                                         |  |
| <i>No Core in Fruits.</i> 110                                                                                                                                                                                                                                                                                                                                                                                   |  |
| <i>Corne changed by sowing often in the same Ground,</i> 111. <i>Changed into a baser Kinde by the Sterility of the Yeare,</i> ib. <i>The Diseases thereof,</i> 136. <i>The remedy of the Diseases.</i> ib. 137. <i>Choice of the best Corne.</i> ib.                                                                                                                                                           |  |
| <i>Corruption.</i> 73                                                                                                                                                                                                                                                                                                                                                                                           |  |
| <i>Court of Vulcan neare Puteoli.</i> 165                                                                                                                                                                                                                                                                                                                                                                       |  |
| <i>Crampe,</i> 211, 212. <i>Two Cures of it.</i> ib.                                                                                                                                                                                                                                                                                                                                                            |  |
| <i>Creatures moving after the severing of the Head,</i> 88. <i>The Causes thereof.</i> ib.                                                                                                                                                                                                                                                                                                                      |  |
| <i>Cruditie.</i> 179                                                                                                                                                                                                                                                                                                                                                                                            |  |
| <i>Chrystall in Caves,</i> 81. <i>Designation of a Triall for making of it.</i> ib.                                                                                                                                                                                                                                                                                                                             |  |
| <i>Cucumbers made to grow sooner,</i> 96. <i>To beare two yeares,</i> ib. <i>By steeping their seeds in Milke, prove more dainty,</i> 98. <i>Made more delicate by throwing in Chaffe, when they are set.</i> ib. <i>They exceedingly affect Moisture,</i> ib. <i>Will grow towards a Pot of Water.</i> ib.                                                                                                     |  |
| <i>Cure by custome,</i> 17. <i>Caution to be used in Diseases counted Incurable,</i> ib. <i>Cure by Excesse.</i> ib.                                                                                                                                                                                                                                                                                            |  |
| <i>ib. The Cause of it.</i> ib. <i>Cure by Motion of Consent,</i> ib. <i>Physicians how to make use of this Motion.</i> ib.                                                                                                                                                                                                                                                                                     |  |
| <i>Curiosities touching Plants.</i> 107, 108, 109, 110                                                                                                                                                                                                                                                                                                                                                          |  |
| <i>Curled Leaves in Plants.</i> 133                                                                                                                                                                                                                                                                                                                                                                             |  |
| <i>Cutting Trees often causeth their long lasting.</i> 120                                                                                                                                                                                                                                                                                                                                                      |  |
| <i>Cuttles Bloud.</i> 156                                                                                                                                                                                                                                                                                                                                                                                       |  |
| <b>D.</b>                                                                                                                                                                                                                                                                                                                                                                                                       |  |
| <b>D</b> amps from Mines, and Mineralls. 202                                                                                                                                                                                                                                                                                                                                                                    |  |
| <i>Day-showres not so good for Fruits, as Night-showres.</i> 135                                                                                                                                                                                                                                                                                                                                                |  |
| <i>Death without paine.</i> 232                                                                                                                                                                                                                                                                                                                                                                                 |  |
| <i>Decoction maketh Liquours clearer; Infusion thicker,</i> 68. <i>The Cause.</i> ib.                                                                                                                                                                                                                                                                                                                           |  |
| <i>Deere,</i> 159. <i>Their Generating.</i> ib.                                                                                                                                                                                                                                                                                                                                                                 |  |
| <i>Degenerating of Plants,</i> 110, 111. <i>The Severall Causes thereof.</i> ib.                                                                                                                                                                                                                                                                                                                                |  |
| <i>Democritus.</i> 204                                                                                                                                                                                                                                                                                                                                                                                          |  |
| <i>Desiccation.</i> 74                                                                                                                                                                                                                                                                                                                                                                                          |  |
| <i>Dew upon Hills better then upon valleys.</i> 165                                                                                                                                                                                                                                                                                                                                                             |  |
| <i>Diamonds Cornish.</i> 2                                                                                                                                                                                                                                                                                                                                                                                      |  |
| <i>Diapason the sweetest of Sounds,</i> 30. <i>The Diapason, or Number of Eight, rather a Thing received, than a true computation,</i> ib. <i>Halfe Notes of Necessity betweene the Unison and Diapason.</i> ib.                                                                                                                                                                                                |  |
| <i>Diet Drinckes,</i> 19. <i>Most troublesome at first.</i> ib.                                                                                                                                                                                                                                                                                                                                                 |  |
| <i>Differences of Plants.</i> 121, 122                                                                                                                                                                                                                                                                                                                                                                          |  |
| <i>Differences of severall Passions in Matter.</i> 182                                                                                                                                                                                                                                                                                                                                                          |  |
| <i>Digging of the Earth Healthfull.</i> 203                                                                                                                                                                                                                                                                                                                                                                     |  |
| <i>Discords in Musicke.</i> 30, 31                                                                                                                                                                                                                                                                                                                                                                              |  |
| <i>Discord of the Base most disturbeth the Musick.</i> ibid.                                                                                                                                                                                                                                                                                                                                                    |  |
| <i>Diseases contrary to predisposition,</i> 17. <i>What the Physitian is to doe in such Cases,</i> ib. <i>Diseases Infectious,</i> 65. <i>Diseases Epidemicall.</i> 85                                                                                                                                                                                                                                          |  |
| <i>Displeasures and pleasures of the Senses,</i> 145. <i>Displeasure light,</i> 151. <i>The Impressions thereof.</i> ib.                                                                                                                                                                                                                                                                                        |  |
| <i>Dissolution of Iron in Aqua Fortis.</i> 166                                                                                                                                                                                                                                                                                                                                                                  |  |
| <i>Divination Naturall.</i> 172                                                                                                                                                                                                                                                                                                                                                                                 |  |
| <i>Dogs know the Dog-killer.</i> 214                                                                                                                                                                                                                                                                                                                                                                            |  |
| <i>Double Flowers.</i> 109, 110                                                                                                                                                                                                                                                                                                                                                                                 |  |
| <i>Downe upon the Leaves of Plants,</i> 117. <i>The vertue of such Leaves.</i> ibid.                                                                                                                                                                                                                                                                                                                            |  |
| <i>Dreames pleasant, and propheticall, procured by some smells.</i> 204                                                                                                                                                                                                                                                                                                                                         |  |
| <i>Drinks,</i> 69. <i>The Maturation of them,</i> ib. <i>How</i>                                                                                                                                                                                                                                                                                                                                                |  |



## A Table of the Chiefe Matters

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                 |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| it is wrought, <i>ib.</i> Wherein it differeth from Clarification, <i>ib.</i> Degrees of Maturation in severall Liquours, <i>ib.</i> Maturation by enforcing the Motion of the Spirits, <i>ib.</i> Quickning of drinke that is dead, <i>ib.</i>                                                                                                                                                                                                                                                                                                                                                                                                                        | Edible Flesh, and not Edible, 186. The Causes of each, <i>ib.</i>                                                                                                                                                                                               |
| Drowning of Mettals, 168, 169                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Eggs, the Folks of them great Nourishers, 14. How to be used, <i>ib.</i> Yolke conduceth more to the nourishment, White to the Generation of the Bird, 25                                                                                                       |
| Drunken Men, 152. Their Sperme unfruitfull, 153. They are unapt for voluntary Motion, <i>ib.</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Eight the sweetest Concord in musicke, 30                                                                                                                                                                                                                       |
| Imagine false things, as to the Eye, <i>ib.</i> Distempred sooner with small Draughts, than with great, <i>ib.</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Elder stick put to consume taketh away Warts, 216                                                                                                                                                                                                               |
| Drying the Adventitious Moisture prohibiteth Putrefaction, 76. Mixture of Dry things prohibite it, <i>ib.</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Electrum, 168                                                                                                                                                                                                                                                   |
| Ductile Bodies, 181, 182                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Electricke Bodies, 200                                                                                                                                                                                                                                          |
| Dulcoration of Things, 133. Of Mettals, 79. Of Fruits by severall Wayes, 186. The Causes of them, <i>ib.</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Elme grafted, 100                                                                                                                                                                                                                                               |
| Dungs of Beasts to enrich grounds, 122. Which of them the best, <i>ib.</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Enforcing a Thought upon another, 207. Instance thereof in a Juglers Tricke, <i>ib.</i> Three Meanes by which it must be wrought, 228.                                                                                                                          |
| Dust maketh Trees fruitfull, 136                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | English man hurt in the Leg hard to cure, 166                                                                                                                                                                                                                   |
| Dwarfing of Trees, 113                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Envie, 205, 206                                                                                                                                                                                                                                                 |
| <b>E.</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Epidemicall Diseases, 85                                                                                                                                                                                                                                        |
| Are dangerous to bee picked in yawning, 140                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Esculent plants, 129. Esculent raw, <i>ib.</i> Having passed the Fire, <i>ib.</i> Not esculent at all, <i>ib.</i>                                                                                                                                               |
| Early Flowers and Plants, 119                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Eunuchs, 142                                                                                                                                                                                                                                                    |
| Earth and Sand differ, 1. Earth Primum Frigidum, 19. Infusions in Earth, 83. The effects thereof, <i>ib.</i> Cautions to be used therein, <i>ib.</i> Severall Instances thereof, <i>ib.</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Excrements of Living Creatures smell ill, 177. The Cause, 178. Some smell well, <i>ib.</i> The Cause, <i>ib.</i> Most odious to a Creature of the same kinde, 214                                                                                               |
| Earth taken out of the Vaults will put forth Herbs, 117. The Nature of those Herbs, <i>ib.</i> What Earth taken out of Shady and Watry Woods will put forth, <i>ib.</i> Earth upon Earth a good Compost, 123. Earths good, and bad, 136. Earths Medicinall, 147. Earth taken neare the River Nilus, 156. Earth pure the Healthfullest smell of all, 203                                                                                                                                                                                                                                                                                                                | Excrecences of Plants, 113, 114, 115, 116, 117. Two Trials for Excrecences, 116. Excrecences joyned with Putrefaction, 117                                                                                                                                      |
| Ebbing and Flowing of the Sea, 200                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Exercise, 66. In what Bodies hurtfull, <i>ib.</i> Not to be used with a spare Diet, <i>ib.</i> Benefits of Exercise, <i>ib.</i> Evils of Exercise, <i>ib.</i> Exercise impingeth not so much as Frictions, 190. The Cause, <i>ib.</i>                           |
| Ecchoes, 56. Artificiall Ecchoes not known, <i>ib.</i> Naturall Ecchoes where found, <i>ib.</i> The Differences betweene the Concurrent Eccho, and Iterant, <i>ib.</i> No Eccho from a Trunke stopped at one end, <i>ib.</i> The Cause, <i>ib.</i> Eccho from within a Well, <i>ib.</i> Whether Ecchoes move, in the same Angle, with the Original Sounds, <i>ib.</i> Plurality of Ecchoes in one place, <i>ib.</i> Back Ecchoes, <i>ib.</i> Ecchoes returning many words, 58. Eccho upon Eccho, 167, 168. The Like betwixt an House and an Hill, 58. Eccho will not returne the Letter S, <i>ib.</i> Difference of Ecchoes, <i>ib.</i> Mixture of Ecchoes, <i>ib.</i> | Eye of the Understanding like the Eye of Sense, 24                                                                                                                                                                                                              |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | The Eyes, 188. Both move one way, <i>ib.</i> See better one Eye shut, <i>ib.</i> The Cause, <i>ib.</i> Why some see one thing double, <i>ib.</i> Pore-blind Men see best neare hand, <i>ib.</i> The Cause, <i>ib.</i> Old Men at some Distance, <i>ib.</i>      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Eyes are offended by over-great lights, 189. By Enterchange of Light and Darknesse on the suddaine, <i>ib.</i> By small Prints, <i>ib.</i> Wax red in in Anger, in Blushing not, <i>ib.</i> The Cause of each, <i>ib.</i> Eye replaced hath recovered sight, 88 |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | <b>F.</b>                                                                                                                                                                                                                                                       |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Fable of Hercules and Hylas, 140                                                                                                                                                                                                                                |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Falling sicknesse how helped, 212                                                                                                                                                                                                                               |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Fas-                                                                                                                                                                                                                                                            |



## A Table of the Chiefe Matters

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                 |
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| <i>Fascination.</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 206          | <i>Flies in excessse, signe of a Pestilentiall Teare,</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                 |
| <i>Fat extracted out of Flesh.</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 139          | <i>155. The Cause.</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | <i>ibid.</i>    |
| <i>Feare, 149, 206. The Impressions thereof.</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 149, 150     | <i>Flight of Birds, the swiftest Motion, 139. The Cause thereof.</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | <i>ib.</i>      |
| <i>Feathers of Birds, why of such fine Colours. 2. How the Colour of them may be changed, 24. 25. Age changeth them.</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 183          | <i>Flint layd at the bottome of a Tree hath helped the Growth. 92. The Cause.</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | <i>ib.</i>      |
| <i>Feathers burnt suppress the Mother.</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 204          | <i>Flowers smell best whose Leaves smell not, 86. Flowers growing amongst the Corne, and no where else, 102. To have Flowers grow upon Trees, 108. To induce Colour into Flowers, 110. Flowers double, 109. To make them so in fruitfull Trees, 110. Flowers, 121. Allexquisitely figured, 110. Numbers of their Leaves.</i>                                                                                                                                                                                                                                                                                                                                                                                                               | <i>ibid.</i>    |
| <i>Female and Male in Plants, 126. The Differences of Female and Male in severall Living Creatures, 184. The Causes thereof. 110.</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 177, 178     | <i>Flying in the Aire of a Body unequal, 167. Of a Body supported with Feathers.</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | <i>191</i>      |
| <i>Fetide Smells.</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 181, 182     | <i>Forming of Parts in young Creatures.</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | <i>7</i>        |
| <i>Fibrous Bodies.</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 127          | <i>Forraine Plants.</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | <i>118, 119</i> |
| <i>Figges in the Spring, 96. Indian Fig.</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 182          | <i>Fowles; Water-fowles foreshew Raine.</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | <i>175</i>      |
| <i>Figurable and not Figurable.</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 121          | <i>Fragile Bodies, 180. The Cause of their Fragilitie.</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | <i>ibid.</i>    |
| <i>Figures of Plants.</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 31           | <i>French-man hurt in the Head, hard to cure.</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | <i>166</i>      |
| <i>Figures or Tropes in Musicke have an agreement with the Figures of Rhetoricke.</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 87, 88       | <i>Frier Bacons Illusion.</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | <i>160</i>      |
| <i>Fire tanneth not as the Sunne doth,</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 140          | <i>Friction a Furtherer of Nourishment, 16. Maketh the Parts more fleshy, 190. The Cause, 110. Impinguateth more than Exercise, 110. The Cause.</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | <i>ibid.</i>    |
| <i>Fire and hot Water heat differently, 140. Fires Subterranny.</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 80           | <i>Frogs in accessse a signe of a Pestilentiall yeare, 155. The Cause.</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | <i>ib.</i>      |
| <i>Fire, and Aire, foreshew Winds.</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 174          | <i>Fruits, their Maturation, 70. The Causes thereof, 110. Severall instances thereof, 110. The Dulcoration thereof by other meanes, 186. The severall Causes.</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | <i>ib.</i>      |
| <i>Fish of the Sea put into fresh Water, 147, 148.</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 175          | <i>Fruit pricked, as it groweth, ripens sooner, 96. Fruit-Tree grafted upon a Wilde-Tree, 97. Fruit Dulcorated by applying of Swinesdung, 98. The Cause, 110. Also by Chaffe, and Swines dung mingled, 110. Enlarged by being covered with a pot as it groweth, 110. Fruits compound, 100, 101. Fruits of divers kinds upon one Tree, 107. Fruits of divers Shapes, &amp; Figures, 110. Fruits with Inscriptions upon them, 110. Fruits that are red within, 109. Fruits comming twice a yeare, 119. Fruits made without Core, or Stone, 110. Fruits that have Iuyces fit for Drinke, 130. Unfit, 110. The Cause of each, 110. Fruits sweet before they be ripe, 132. Which never sweeten, 110. Fruit blossoming hurt by South-Windes.</i> | <i>135</i>      |
| <i>Fishes foreshew Raine.</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 175          | <i>Fuell not consuming, 163, 164. Fuell consuming fast, 110. Fuell cheape.</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | <i>ib.</i>      |
| <i>Fishes greater than any Beasts, 184. The Cause.</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <i>ibid.</i> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                 |
| <i>Fixation of Bodies.</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 169          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                 |
| <i>Flame and Aire mix not, 8. Except in the Spirits of Vegetables, 110. And of Living Creatures, 110. Their wonderfull Effects mixed, 9. Forme of Flame would be Globular, and not Pyramidall, 110. 9. Would be a lasting Body, if not extinguished by Aire, 110. Mixeth not with Flame, 110. Burnes stronger on the sides, than in the Midst, 110. Is irritated by the Aire ambient, 110. Opinion of the Peripateticks of the Element of Fire, 110. Preyeth upon Oyle, as Aire upon Water, 24. Taketh in no other Body into it, but converteth it, 169. Flame causing water to rise, 192. Flame, 81. The Continuance of it according to severall Bodies, 110. Observation about going out of Flame, 110. 82. Lasting thereof in Candles of severall Mixtures, 110. Of severall Wickes, 110. 83. In Candles laid in Bran, 110. In Lamps, 110. Where it draweth the nourishment farre, 110. In a turretted Lampe, 110. Where it is kept close from Aire, 83. According to the Temper of the Aire, 110. 83. Irritated by Cold, 110. Flesh dissolved into Fat, 139. Flesh Edible and not Edible, 186. The Causes of each, 110. Horses Flesh sometimes eaten, 110. Mans Flesh likewise, 110. Eaten by Witches.</i> | <i>ib.</i>   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                 |

Full



## contained in these Centuries.

Full of the Moone, 193. Severall effects of it,  
ib. Trials for further Observations. 194  
Fumes taken in Pipes. 203

### G.

**G**alileus his opinion of the Ebbing and  
Flowing of the Sea. 167  
Gaping a Motion of Imitation. 65  
Garments of what Plants they may be made.  
128  
Gathering of Wind for freshnesse, 164  
Generation opposed to Corruption. 73  
Generating of some Creatures at set times  
onely, Of some at all times, 159. The Cause of  
each, ib. 160  
Genius Over-mastring. 205  
Germination accelerated by severall meanes,  
90, 91, 92. Retarded by severall meanes, 92  
Ginny-Pepper causeth sneezing. 202  
Glasse the Materials thereof in Venice, 162.  
Glasse out of Sand, 164. Glasse, whether re-  
moulten, it keepeth weight. 169  
Globes at distance appearing flat. 190  
Glo-worme. 149  
Gold, 71. The making of it, ib. A worke possi-  
ble, but not rightly pursued, ib. Discourse  
of a Stranger touching the Making of it, 72.  
Directions for the Making of it, ib. 73.  
Direction of a Triall, ib. Severall proper-  
ties of Gold, ib. Gold hath in it the least  
volatile of any Mettall. 169  
Gout, Order in Curing it. 16  
Grafting, 92. A late-comming Fruit upon an  
Early Fruit-Tree, 93. Grafts in great Plen-  
ty, 95. Grafting meliorateth the Fruit, 97.  
Grafting of Trees that beare no fruit en-  
largeth the Leaves, 100. Grafting of sever-  
all kinds maketh not Compound Fruits, ib.  
Grafting Vine upon Vine. 136  
Grapes how they may be kept long, 129. Also by  
preserving of the stalk. ib.  
Gravity, 10. Motion of Gravity, ib. 148. Opi-  
nion of Mooving to the Center, a vanity. 10  
Greatnes comparative of living Creatures, 184  
Greennesse, in some Plants, all Winter, 121,  
122, The Cause. ib.  
Grief & Paine, 150. The impressons thereof, ib.  
Growing of certaine Fruits, and Herbs, after  
they are gathered, 7, 8. The Cause, ib. Triall  
whether they increase in weight. ib.  
Growing, or Multiplying of Mettals. 168  
Gumme of Trees. 2

Gun-powder, 8. The cause of the great Noyse it  
yeeldeth, ib. White giveth no sound. 30

### H.

**H**Aires of Beasts not of so fresh Colours, as  
Birds Feathers, 2. How the Colour of  
them may be changed, 24, 25. Haire on the  
Head in Children new borne, 139. Haire  
changing Colour, 183. Haire of the Partie  
beloved worne, exciteth love. 216  
Hands have a Sympathy with the head, and  
other Parts. 25, 26  
Hard substances in the Bodies of Living Crea-  
tures, 157. Most about the Head, ib. Some of  
them stand at a stay, some continually grow  
ib. All of them without sence, but the Head.  
158  
Hard Bodies, 181. The Cause. ib.  
Hart of an Ape worne increaseth Audacitie,  
213  
Hawes and Heps, in store, portend cold Win-  
ters. 155  
Head cut off, in some Creatures, leaveth a little  
space of Motion, 88. The Causes. ib.  
Healthfull Aires oft-times without sent. 199,  
200  
Hearing hath more Operation upon the Man-  
ners, and Spirits of Men, than other senses,  
31, 32. Hindrances of Hearing, 62. Hear-  
ing hindered by Tawning, ib. The Cause, ib.  
Helped by bolding the Breath, ib. The Cause,  
ib. Instruments to helpe the Hearing, ib.  
Used in Spaine. ib.  
Heat the chiefest Power in Nature. 27  
How to make triall of the highest operation of  
it, ib. Heat and Time worke the like effects  
65. Their different operations in many  
things, ib. Heat being qualified by Moisture,  
the effect, 140. Heat causeth the differences  
of Male, and Female, 184. Also many other  
differences thereupon, ib. The same tempered  
with Moisture, ib. The severall Effects of  
Heat, in the Sunne, Fire, and Living Crea-  
tures, ib. Heat within the Earth, 191. Triall  
of drawing it forth by the Moon-beams, 193  
Heats under the Equinoctiall, lesse than under  
the torrid Zones, 87. Three Causes thereof, ib.  
Heathen Opinion, touching Generation of  
Creatures perfect by Concretion, refuted, 194  
Heavenly bodies true Fires. 195  
Hedge-hogs Flesh, a great Dryer. 113  
Heliotropia, 114. The Causes of their Opening,  
and



## A Table of the Chiefe Matters

|                                               |          |                                                    |     |
|-----------------------------------------------|----------|----------------------------------------------------|-----|
| and Shutting, or bending towards the Sun      | ibid.    | kind, ibid. 210. To worke by one that hath         |     |
| Hemlock causeth easie Death.                  | 132      | a good opinion of you, ib. To worke by many,       |     |
| Herbs removed from Beds into Potts, prosper   |          | ib. Meanes to preserve Imagination in the          |     |
| better, 98. Grow Sweeter by Cutting off       |          | Strength, ib. It worketh more at some              |     |
| the first Sprout, 99. The Cause thereof ib.   |          | times, than others, ib. It hath most force         |     |
| Inquirie whether they be made Medicina-       |          | upon the highest motions, ib. 211, 215, 216        |     |
| ble. and how, 105. Foure Designations of      |          | Effects of the Sense.                              | 168 |
| it ib. Their ordinary Colours, 109. Herbs     |          | Imagination imitating the Imitations of            |     |
| growing out of the Water without Rootes,      |          | Nature, 1. Imitation in Men, and other             |     |
| 117. Growing out of the Top of the Sea        |          | Creatures, 55. A Thing to be wondred at, ib.       |     |
| without Roots, ib. 118. Growing out of        |          | Severall Motions in Men of Imitation,              | 65  |
| Snow, ibid. Growing out of Stone, ibid.       |          | Impressible, and Not Impressible.                  | 182 |
| Growing in the Bottomes of Mines, ibid.       |          | Impulsion and Percussion of Bodies, 160, 161.      |     |
| None growing out of Sea-sands, ib. Herbs      |          | Impulsion of a Body unequall.                      | 167 |
| dying yearely, ib. That last many yeares,     |          | Inanimate and Animate wherein they differ.         | 125 |
| ib. The largest last not longest, as the lar- |          | Incense thought to dispose to Devotion, by the     |     |
| gest Trees doe, ib. The Cause, ib. Herb in    |          | Operation of the smell.                            | 204 |
| likenes of a Lambe, 127. The Fable of it, ib. |          | Incubus how helped.                                | 212 |
| Herbs wild shew the Nature of the Ground,     |          | Indian Earth brought over, hath produced In-       |     |
| 135. Herbs which like to be Watred with       |          | dian Plants, 118. Indian Fig.                      | 127 |
| salt Water, 137. Herbs foreshew Raine,        | 176      | Indian Tree with leaves of great largenesse,       |     |
| Hiccough, 140. The Cause of it, ib. Meanes to |          | and Fruit without stalks,                          | 127 |
| cease it                                      | ib.      | Induration of Bodies, 22. Three Meanes to          |     |
| Honey, 127, 183. Severall waies how it is     |          | effect it, ib. Examples thereof, ib. 23. Indu-     |     |
| used                                          | ib.      | rations by Snow or Ice, ib. By Metalline           |     |
| Honey-Dewes upon certaine Leaves, and         |          | Waters, ib. In some Naturall Spring-Wa-            |     |
| Flowers                                       | 104      | ters, ib. Of Metalls by Heating and Quen-          |     |
| Hornes, 157. Horned Beasts have no upper      |          | ching, ib. By Fire, ib. By Decoctions within       |     |
| Teeth.                                        | 158      | Water, the Water not touching, ib. 24. In-         |     |
| Horses flesh eaten, 186. Horses Tooth the     |          | duration by Sympathy.                              | 182 |
| Mark of their age, 158. Horse-Tooth Ring      |          | Infant in the Wombe suffering from the Mo-         |     |
| good for the Crampe.                          | 111, 112 | thers Diet.                                        | 113 |
| Hot Bread nourishing in the Odours thereof,   |          | Infectious Diseases.                               | 65  |
|                                               | 204      | Influences of the Moone, 192, 193, 194. In         |     |
| Humours ill lodged very dangerous,            | 18       | number foure.                                      | ib. |
|                                               |          | Influxes of the Heavenly Bodies.                   | 200 |
| I                                             |          | Infusions in Liquours, 4. A short stay best, ib.   |     |
| I Ayle a most pernicious smell.               | 201      | Infusions to be iterated, ib. Usefull for Me-      |     |
| Iewer-Eare.                                   | 115      | dicinall Operations, ib. Triall which Parts        |     |
| Image whether it might be seene without see-  |          | issue soonest, which slowest, 5. Evaporations      |     |
| ing the Glasse.                               | 160      | of the finer spirits sometimes usefull.            | ib. |
| Imagination exalted, 198. Force of it, ib.    |          | Infusion maketh Liquours thicker, but Deco-        |     |
| 199. Three Cautions about the same. Wor-      |          | ction clearer, 68. The Cause.                      | ib. |
| keth most upon weake persons, ib. Imagina-    |          | Infusions in Aire, 5. The severall Odours issue    |     |
| tion, 206. The kinds of it, ib. The Force of  |          | at severall times.                                 | ib. |
| it upon another Body, ib. 207. Severall in-   |          | Infusions in Earth, 83, 84. The Effects of it, ib. |     |
| stances of it, ib. Et in Seq. An Instance     |          | Cautions to be used in it, ib. Severall In-        |     |
| thereof by a paire of Cards, ib. Three Meanes |          | stances thereof.                                   | ib. |
| to impose a Thought, 208, 209. Designa-       |          | Iniquation or Inconcoction.                        | 179 |
| tions for Triall of the Operations in this    |          | Inscriptions upon Fruits.                          | 108 |
|                                               |          | Insecta, 143. The Name communicated to all         |     |
|                                               |          | creatures bred of Putrefaction, ib. The Diffe-     |     |
|                                               |          | rence                                              |     |



## contained in these Centuries.

renca of them, according to the severall  
 Matters they are bred of, 143, 144, 145.  
 The Enumeration of many of them, ib. Se-  
 verall Properties in them, ib. They have vo-  
 luntary Motion, ib. Other senses beside  
 Taste. ib.  
 Invisibles in Bodies ought to bee better inqui-  
 red. 26  
 Iovinianus the Emperour. 202  
 Joy 150. The Impressions thereof. ib.  
 Joynts in some Plants, 121. The Cause thereof.  
 ib.  
 Ippocrasse clarified. 2  
 Iron Instruments hurtfull for Wounds. 166  
 Islanders Bodies. 85  
 Ivy growing out of a Stags Horne. 115  
 Juices of Fruit fit for Drinks, 130. Vnsit for  
 them, ib. The Cause of each. ib.  
**L.**  
 Ladanum. 128  
 Lard put to wast taketh away Warts. 116  
 Latitude. 154  
 Lasting Trees and Herbs, 120. Designation to  
 make Plants more lasting than ordinary.  
 ib.  
 Late Flowers, and Plants. 119  
 Laughing, 151, 152. The Impressions thereof,  
 ib.  
 Leaning long upon any Part. 154, 155  
 Leaping, 145. Helped by Weights in the Hands.  
 ib.  
 Leaves nourish not, 12. The Cause, 130. Leaves  
 of Trees, and Herbs, 127. Plant without  
 Leaves. 162  
 Left-side, and Right, 190. Senses a like strong  
 on each side. Limms strongest on the Right,  
 ib. The Cause of each. ib.  
 Life by what Courses prolonged. 64  
 Lights over-great offend the eyes. 188, 189  
 Light comforteth the Spirits, 211. Especially  
 Light varied. ib.  
 Lincostris. 132  
 Liquefiable, and not Liquefiable, 180. Bodies  
 that Liquefie by Fire, ib. Others, that by Wa-  
 ter, ib. Some, that by bath. ib.  
 Liquours their Clarification, 67. Three Causes  
 thereof, ib. 68. Preservation of Liquours in  
 Wells, or Vaults, 85. Liquors compressed, 187  
 Their Incorporation with Powders. 65.  
 Living Creatures that generate at certaine

Seasons onely, 159. Others, that at all Sea-  
 sons, ib. The Cause of each, ib. Their severall  
 Times of Bearing in the VVombe, ib. 160.  
 The causes thereof, ib. The severall Numbers  
 which they bring forth at a Burthen, ib. The  
 Causes, ib. Living Creatures that will bee  
 transmuted into another Species, 111. Living  
 Creatures foreshew Weather. 175  
 Love. 205  
 Luciole in Italy. 149  
 Lupines. 136  
 Lust, 152. The Impressions thereof. ib.  
 Lying in what kinde of Posture healthfull.  
 154

### M.

**M**agical Operations. 198, 200, 204.  
 Maiz. 13  
 Male and Female, the Differences of them in  
 severall Living Creatures, 184. The Causes  
 thereof, ib. 184. Male and Female in Plants,  
 126. Male-Piony good for the Falling Sick-  
 nesse, and Incubus. 212  
 Malesciating, 192. Practised in Gascony. ib.  
 Malt, 123. The Swelling thereof, ib. The Sweet-  
 nesse thereof. ib.  
 Mans flesh eaten, 6. Breedeth the French Dis-  
 ease, ib. Causeth high imaginations, ib. Not,  
 in itselfe, edible, 186. The Cause, ib. How  
 eaten by Canibals, ib. Wherefore by Witches.  
 ib.  
 Mandrakes. 128  
 Manna. 165  
 March, towards the end, the best Discoverer of  
 Summer Sicknesses. 173  
 Marle a good Compost. 122, 123  
 Marrow. 157, 158  
 Maturation, 179. Of Drinkes, 69, 70. Of  
 Fruits, ib. Maturation or Digestion. 71,  
 73.  
 Meates inducing Satiety. 66  
 Medicines changed helpfull, 18. Medicines  
 which affect the Bladder, 25. Medicines  
 Condensing, which relieve the Spirits, 155  
 Medicinable Herbs. 104, 105  
 Megrims come upon Rising, not during the  
 Sitting. 154  
 Melancholy Persons dispose the Company to the  
 like. 205  
 Melioration of Fruits, Trees, and Plants, 93,  
 94, 95, 96, 97, 98, 99, 100.  
 Melo-



## A Table of the Chiefe Matters

Melo-cotones grow best without Grafting. 97.  
The Cause thereof. ib.  
Memory the Art, 210. Men, better places, than  
wards, ib. Memory strengthened by the  
Braines of some Creatures. 213  
Menstruous Woman. 202  
Mercuriall and Sulphureous. 78  
Mettals and Plants, wherein they differ, 126.  
Growing of Mettals, 168. Drowning of  
Mettals, ib. 169. Refining of Mettals, 183.  
Mettaline Vapours hurtfull to the Braine,  
202. Mettals giue Orient Colours in their  
Dissolution, 64. The Causes. ibid.  
Milke warme from the Cow a great Nourisher,  
14. How to be used, ib. Comes Milke better  
than Asses Milke, ib. Or than Womans Milk,  
ib. Milke in Beasts how to be increased, 164.  
Milke used for Clarification of Liquours.  
69. Good to steep diuers seeds in, 98. Preser-  
ving of Milke, 85. Milke in Plants. 131  
Mildew. 104, 136  
Minced Meat, a great Nourisher, 14. How to be  
used. ib.  
Misseltoe. 116  
Mixture of Earth, and Water, in Plants. 79  
Moist Aire how discovered. 173  
Moisture adventitious, Cause of Putrefaction,  
68. Moisture qualifying Heat, the Effect,  
140. Moisture increased by the Moone, 193.  
Triall of it in Seeds, ib. In Mens Bodies, ib.  
Force of it in Vegetables. 103, 104  
Monsters. 100  
Moone attractive of Heat out of Bodies. 20  
Moones Influences, 192, 193, 194. In number  
foure, ib. It increaseth Moisture. ib.  
Morsus Diaboli an Herbe. 134  
Mortified parts by Cold, 166. Must not approach  
the Fire, ib. Cured by applying Snow, ib. Or  
warne Water. ib.  
Mosse, 75, 113. Where it groweth most, ib. The  
Cause of it, ib. What it is, ib. Mosse Sweet.  
114. In Apple Trees Sweet, ib. In some o-  
ther Trees. 132  
Mother suppressed by burning Feathers. 204  
Mothers Diet affecteth the Infant in the  
Wombe. 213  
Motion hindreth Putrefaction. 75  
Motion of Bodies, 161. Motion of Liberty, 3,  
Motion of Nexce. 192 Motion of Consent in  
Mans Body, 10, 17. Motion of Attraction  
would prevaile, if Motion of Gravity hin-  
dred not. 148  
Motions in Men by Imitation. 65  
Moulding of Fruits. 108  
Moulds. 75  
Mountaines Great, foreshew Tempests Early.  
174  
Month out of Taste, 141. What Tasts it will not  
have. ib.  
Mulberry Lease. 161  
Mummy Stancheth Bloud. 213  
Murthered Body bleeding at the approach of  
the Murtherer. 210  
Muscovia hath a late Spring, and early Harvest,  
119. The Cause. ib.  
Mushromes, 115. Their properties, ib. Severall  
productions of them, ib. Where they grow  
most. 131  
Musicke, 29. Muscicall and Immuscicall Sounds,  
ib. Bodies producing Muscicall Sounds, ib. 30.  
Diapason the sweetest of Sounds, ib. Fall of  
Halse-notes necessary in Musicke, ib. Con-  
sent of Notes to bee ascribed to the Ante-  
notes, not Entire-notes, 30. Concords per-  
fect and Semi-perfect, which they are, ib.  
The most odious Discords of all other, ib.  
Discord of the Base most disturbeth the Mu-  
sicke, ib. 31. No Quarter-Notes in Musicke,  
ib. Pleasing of Single Tones answereth to  
the pleasing of Colour, And of Harmony to  
the pleasing of Order, ib. Figures or Tropes  
in Musicke have an agreement with the Fi-  
gures in Rhetoricke, ib. Musicke hath great  
operation upon the Manners and Spirits of  
Men, ib. 31, 32. Concords and Discords in  
Musicke are Sympathies and Antipathies of  
Sounds, 61. Instruments that agree best in  
Consort, ib. Instruments with a double Lay  
of Strings, Wire, and Lute-Strings. 62  
N.  
Nature, 63. Advice for the true Inquisiti-  
on thereof. ib. 64  
Naturall Divination. 172  
Negro's. 88  
Night-Showres, better for Fruit, than Day-  
Showres. 135, 136  
Nights Star-light, or Moone-shine, colder than  
Cloudy. 188  
Nilus, the vertues thereof, 161. How to clarifie  
the Water of it. ib.  
Nitre good for Men grown, ill for Children, 78.  
Nitrous Water, 80. Scoureth of it selfe, ib.  
Nitre mingled with water maketh Vines  
sprout, 96. Nitre upon the Sea-Sands. 163



## contained in these Centuries.

Nourishing Meates and Drinckes. 12, 13  
Nourishing Parts in Plants. 14, 130  
Nourishment, 14. Five severall Meanes to helpe  
it, ib. 15, 16. Nourishment mended, a great  
Helpe. 95  
Numa's two Coffins. 163

### O.

**O**ake-Leaves gather Honey-dewes. 104  
Oake-Boughes, put into the Earth, bring  
forth wilde Vines, 111. Oake-Apples. 117  
Oake beares the most Fruits amongst Trees,  
157, 158. The Cause. ib.  
Objects of the Sight cause great delight in the  
Spirits, but no great offence, 189. The Cause.  
ib.  
Occhus a Tree in Hircania. 127  
Odious Objects cause the Spirits to fly, 167  
Odours in some degree, nourish. 204  
Ointment used by Witches. 213  
Old Trees bearing better than the same new.  
131  
Old Men conversing with young Company, live  
long. 205  
Onions made to wax greater, 99. In growing  
carry the Seed to the Top. 133  
Operations of Sympathy. 200  
Opium. 20  
Order in curing of Diseases. 16, 17  
Orange Flowers infused, 4. Orange Seeds, sowne  
in April, will bring forth an excellent Sal-  
let Herb. 119  
Orris Root. 187  
Ox-Horne bringeth forth Ivie. 115  
Oyle Substances and Watry, 76. Commixture  
of Oyle Substances prohibiteth Putrefaction.  
ib. Turning of Watry Substances into Oyle,  
79. A great Worke in Nature, ib. Some In-  
stances thereof. ib.  
Oyle of Sweet Almonds a great Nourisher, 14.  
How to be used. ib.

### P.

**P**alliation in Diseases. 17  
Paine and Griefe, 150. The Impressions  
thereof. ib.  
Paintings of the Body, 155. Barbarous People  
much given to it. 156, ib.  
Panicum. 95  
Pantomimi. 56  
Paper Charoletted. 156

Paracelsus Principles. 78, 79  
Parents finding an alteration, upon the ap-  
proach of their Children, though unknowne  
to them. 205  
Parts in Living Creatures easily reparable, and  
Parts hardly reparable, 16. Parts of Living  
creatures severed, 216. Their Vertues in  
Naturall Magicke. 216  
Passions of the Minde, 150, 151, 152. Their se-  
verall Impressions. ib.  
Peaches prove best without Grafting, 97. The  
Cause thereof. ib. 10  
Pearle said to recover the Colour by buriall in  
Earth. 84  
Pepper Genny causeth sneezing. 202  
Perception in all Bodies, 171. More subtill  
than the sense, ib. It worketh also at Di-  
stance, ib. The best Meanes of Prognostica-  
ting. ib. 172  
Percolation, Inward, and Outward. 1, 2  
Percussion and Impulsion of Bodies. 160, 161.  
Perfumes, Dryers, and Perfumes Moysteners of  
the Brayne, 203. Perfumes procure pleasant  
and Propheticall Dreames. 204  
Persons neare, in Bloud, or other Relations,  
have many secret passages of sympathy. 214  
Pestilentiall yeares, 85. Their Prognosticks. 155  
172, 173  
Philosophy received. 178  
Pilositie in Men and Beasts, 139. The Cause  
thereof. ib.  
Pistachoes. 13  
Pit upon the Sea-Shore, 1. Filleth with Water  
potable, ib. Practised in Alexandria, ib. And  
by Caesar, ib. Who mistook the Cause, ib. In  
time will become Salt againe. 191  
Pitty, 151. The Impressions thereof. ib.  
Pius Quintus his Revelation touching the  
Victory at Lepanto. 215  
Plague transmitted without sent, 200, 201. The  
supposed Sent of it, ib. Persons least apt to  
take it, and Persons most, ib. Plagues caused  
by great Putrefactions, 202. Preservatives  
against it. 212  
Plaine Tree Watered with Wine. 128  
Plants why of greater Age than Living Crea-  
tures, 15, 16. Dignity of Plants, 89. Accel-  
eration of their Germination, ib. 90, 91, 92.  
Retarding of their Germination, ib. The  
Melioration of them divers wayes, 93, 94,  
95, 96, 97, 98, 99, 100. Cause why some dye  
in Winter, 96. Sympathy and Antipathy of  
Plants, 101, 102, 103, 104. Plants drawing  
the



## A Table of the Chiefe Matters

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| the same Inyces out of the Earth, thrive not together. 101. Drawers of much Nourishment hurt their neighbour Plants. ib.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Plates of Mettall assuage Swelling. 187                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Drawing severall Inyces thrive well together. 102. Several Instances of Each. ib. Designations for further trials hereof. ib. Trial in Herbs poysonous, or Purgative. 103. Plants that dye placed together. ib. Triall whether Plants will attract Water, at some distance. 104. Curiosities touching Plants. 107                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Pleasures and Displeasures of the Senses. 145                                                                                                                                                                                                                                                                                                                                                                                                                      |
| 108, 109, 110. Plants will degenerate, 110, 111. The severall Causes thereof. ib. Transmutation of Plants. ib. Six Designations thereof. ib. 112, 113. Their severall Excreescences. 113, 114, 115, 116, 117. Prickles of Trees. 116. Plants growing without Seed. 117, 118. Growing out of Stone. ib. Plants forraine. ib. 119. Removed out of hot countries will keepe their seasons. ib. Set in the Summer seasons, will prosper in colder Countries. ib. Seasons of severall Plants. ib. Plants bearing Blossomes, and young Fruits, and ripe Fruits, together. 119, 120. Plants with Ioynts or Knuckles in the Stalkes. 121. The Causes thereof. ib. Differences of Plants. ib. 122. Some putting forth Blossomes before Leaves. 121. Others Leaves before Blossomes. ib. The Cause of each. ib. Plants green all Winter. 121, 122. The Cause. ib. Plants not supporting themselves. ib. The Cause of their Slendernesse. ib. Plants, and Inanimate Bodies, differ in foure things. 125, 126 | Plough followed, healthfull. 203                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Plants and Mettals, in three. ib. Plants, and Moulds or Putrefactions, wherein they differ. ib. Plants and Living Creatures their Differences. ib. 126, 127. Male and female in Plants. ib. Plants whereof Garments are made. 128. Plant Sleeping. ib. Plants with bearded Roots. ib. Plants Esculent. 129, 130. Esculent Ram. ib. Having passed the Fire. ib. Parts in Plants that are nourishing. ib. Seeds in Plants more strong, than either Leaf or Root. ib. The cause. ib. In some not. ib. Plants with Milke in them. 131. Plants with red Inyce. 132. No Plants have a salt Taste. ib. Plants with curled Leaves. 133. Plants may be translated into other Regions. 135. Yet they like some Soyles more than other. ib. Severall Instances thereof. ib. Plant without Leaves. 162. Singularities in severall Plants. 138                                                                                                                                                                 | Plumositie in Birds. 139. The Cause thereof. ibid.                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Plaster hardening like Marble. 165                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Plums of what colour the Best. 109. The dryer, the better sort. ib.                                                                                                                                                                                                                                                                                                                                                                                                |
| Plastered Roome, Greene, dangerous. 202                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Pneumatics in Bodies. 181                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Pomanders. 203                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Pont-Charenton the Eccho there. 57                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Pore-blind men see best nere hand. 188. The Cause. ib.                                                                                                                                                                                                                                                                                                                                                                                                             |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Potado Rootes potted grow greater. 99                                                                                                                                                                                                                                                                                                                                                                                                                              |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Powder in Shot. 3                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Powders and Lignours their Incorporation. 65                                                                                                                                                                                                                                                                                                                                                                                                                       |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Poysoning of Aire. 201                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Poysoning by Smells. ib. 202. Caution touching Poysoning. ib.                                                                                                                                                                                                                                                                                                                                                                                                      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Poysonous creatures love to lie under Odorate Herbes. 138                                                                                                                                                                                                                                                                                                                                                                                                          |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Precious Stones comfort the Spirits. 211                                                                                                                                                                                                                                                                                                                                                                                                                           |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Preservations of Bodies from Corruption. 28                                                                                                                                                                                                                                                                                                                                                                                                                        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Preservation of Fruits in Sirrups. 129. Also in Powders. ib. When to gather Fruits for Preservation. ib. Also in Bottles in a Well. ib. Preserving Grapes long. ib. Another way thereof. 134                                                                                                                                                                                                                                                                       |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Prickles of Trees. 116, 117                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Procreations by Copulation, and by Putrefaction. 194. The Cause of each. ibid. 195                                                                                                                                                                                                                                                                                                                                                                                 |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Prognosticks, for plenty, or scarcity. 138. Of Pestilentiall yeares. 141, 155, 172, 173. Of Cold and long Winters. 174. By Birds. 175. Of an hot and dry Summer. ibid. By the Birds also. ibid. Of Winds. ibid. Of great Tempests. ib. Of Raine. ib. From living Creatures. ib. From Water-Fowles, and Land-Fowles. 176. From Fishes. ib. From Beasts. ib. From Herbes. ib. From Aches in Mens Bodies. ib. From Wormes. ib. From the sweating of solid Bodies. ib. |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Proprieties secret. 217, 218                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Purging Medicines. 5. Have their vertue in a fine Spirit. Endure not Boyling. ib. Taking away their unpleasant Taste. ib. Severall wayes of the Operations of Purging Medicines. 10, 11, 12. They worke upon their proper Humours. 11. Medicines that purge by Stool, and that purge by Urine. 12                                                                                                                                                                  |



contained in these Centuries.

12. Their severall Causes, *ib.* Worke in these  
waies, as they are given in quantity, *ib.* Pre-  
parations before Purging, 18. Want of Prepa-  
ratives what hurt it doth, both in Purging,  
*ib.* And after Purging, *ib.*  
Putrefaction, 73. Acceleration of it, *ib.* The  
Cause of Putrefaction, *ib.* Putrefaction  
whence, 74. Ten meanes of enducing Putre-  
faction, *ib.* Prohibiting of Putrefaction, 75.  
Ten Meanes of Prohibiting it, *ib.* 76. Incep-  
tions of Putrefaction, 79. Putrefactions,  
for the most part, smell ill, 177. The Cause,  
*ib.* Putrefaction from what Causes it com-  
meth, 178. Putrefaction enduced by the  
Moone-beames, 192  
Putrefactions of Living Creatures have caused  
Plagues, 202  
Putrefied Bodies most odious to a Creature of  
the same kind, 214  
Pyrrhus had his Teeth undivided, 158  
Pythagoras his Philosophy, 197  
Q  
Varries that grow hard, 183  
Quick-silver will conserve Bodies, 168  
Quick-silver fixed to the Hardnesse of Lead,  
182  
R  
Racking of Wine, or Beere, 68  
Raine in Ægypt scarce, 161. The Cause  
thereof, *ib.* Severall Prognosticks of Raine  
175, 176  
Rainebow said to bring Sweetnesse of Odour to  
Plants under it, 176, 177  
Rams-skins good to be applied to Wounds, 139  
Red within some few fruits, 109  
Red Iuyce in plants, 132  
Reedes, 134  
Refining of Mettals, 183  
Refraction causeth the Species Visible to ap-  
peare bigger, 160. Other Observations  
about Refractions, *ib.*  
Repletion hindreth Generation, 94  
Rest causeth Putrefaction, 75  
Retardation of Germination, 92  
Rhen helpeth the Fig-tree, 102  
Rheumes how caused, 11  
Rice a nourishing Meat, 13  
Right-side, and Left, 190. Senses alike strong  
on both sides, Lims strongest on the Right,  
*ib.* The cause of each, *ib.*

Roomes built for Health, 204  
Roots of Fruit-Trees multiplied, 93, 94. Root  
made great, 95. By applying *Panicum* about  
it, *ib.* Roots potted grow greater, 99, 100.  
Roots preserved all Winter, *ib.* Roots of  
Trees that descend deepe, 133, 134. Others  
that spread more, *ib.* The Cause of each, *ib.*  
Roots of Plants of three sorts: Bulbous, Fi-  
brous, Hirsute, 128  
Rosa solis the Herb, 104  
Roses Damask how conserved, 81  
Rubarb infused, 4, 5. For a short time best, *ib.*  
Repeated may bee as strong as Scammony,  
*ib.* A Benedict Medicine, 5. Caution in the  
taking thereof, 11  
Rust of Mettals, 74

S.

Society in Meats, 66  
Salamander, 186, 187. The Cause that it  
endureth the Fire, *ib.*  
Salt a good Compost, 123. Salt in Plants, 132.  
Salt hath a Sympathy with Blood, 214. It is  
an Healer, *ib.* It riseth not in Distillations,  
190, 191  
Salt-Peter how it may be bred, 123  
Salt-Water passed through Earth becomes  
fresh, 1. Foure Differences betweene the pas-  
sing it in Vessels, and in pits, 2. Salt-Water  
good for to Water some Herbs, 137, 138.  
Salt-water boyled becommeth more potable  
190, 191. Salt-water sooner dissolving Salt,  
then Fresh water, *ib.* The Cause, *ib.*  
Sand turning Minerals into a Glasie Sub-  
stance, 164  
Sanguis Draconis: The Tree that beares it,  
132  
Sap of Trees, 134. The differing Nature there-  
of in severall Trees, *ib.*  
Scarlet-die, 191, 192  
Sciisile and Not Sciisile, 182  
Sea clearer, the North-wind blowing, than the  
South, 139. Sea by the Bubbles foresheweth  
Wind, 175. Sea-Water looketh blacke, mo-  
ved; White, resting, 139. The Cause, *ib.* Seas  
shallow, and narrow, breake more, than  
deepe, and large, 190  
Sea-Fish put into Fresh-waters, 147  
Sea-Hare, comming neare the Body, hurteth  
the Lungs, 214  
Sea-Sand a good Compost, 123. Sea-sands  
produce no Plant, 118

Seasons



## A Table of the Chiefe Matters

|                                                  |          |                                                  |
|--------------------------------------------------|----------|--------------------------------------------------|
| Seasons of Plants,                               | 119      | ib. Best where the Body is Crushed. ib. Not so   |
| Secret Proprieties.                              | 217, 218 | in Flowers crushed. ib. Best in Flowers whose    |
| Secundine.                                       | 154      | Leaves smell not. ib. Smells sweet. 177. Have    |
| Seeds in Plants more strong, than either Leaf,   |          | all a Corporall substance. ib. Smells fetide.    |
| or Root. 130. The cause. ib. In some not. ib.    |          | ib. 178. Smell of the Tayle most pernicious.     |
| Seeds their choyce. 137. Plants growing with-    |          | 201. Smells that are most dangerous.             |
| out seed.                                        | 117, 118 | ibid.                                            |
| Senses, their Pleasures, and displeasures.       | 145      | Snakes- skinne worne.                            |
| Their Instrumētts have a similitude with that    |          | 212                                              |
| which giveth the reflection of the object.       | 62       | Sneezing ceaseth the Hiccough. 140. Induced      |
| Separation of severall Natures by straining.     | 2        | by looking against the Sun. ib. The cause        |
| Of severall Liquors by Weight. 3. And of the     |          | thereof. ib.                                     |
| same kinde of Liquors thickned. 4. Of Met-       |          | Snow-water. 87. Snowes cause Fruitfulnesse.      |
| tals.                                            | 169      | ib. Three causes thereof. ib. Snow good to be    |
| Separation of the Cruder parts prohibiteth Pu-   |          | applied to a mortified part. 166. The cause      |
| trification.                                     | 76       | thereof. ib. Snow bringing forth Herbs.          |
| Servets used in Turkey.                          | 148      | 118                                              |
| Setting of Wheat.                                | 95, 96   | Soles of the Feet have a sympathy with the       |
| Setting of Trees higher, or lower.               | 99       | Head.                                            |
| Severall Fruits upon one Tree.                   | 107      | 25                                               |
| Shade helpeth some Plants.                       | 95       | Soft Bodies. 181. The Cause. ib. They are of two |
| Shadomes seeming ever to tremble                 | 190      | sorts. ib.                                       |
| Shame. 151. 206. The Impressions thereof. 151    |          | Solide Bodies sweating foreshew Raine. 176       |
| Shell-fish have no Bones within. 157, 189, 190   |          | Soot a good Compost. 123                         |
| Shifting for the better, helpeth Plants, and Li- |          | Sorrell. 137. The Root thereof. ib.              |
| ving creatures.                                  | 95       | Soule of the World. 197, 198                     |
| Shining Wood.                                    | 77, 78   | Sounds Muscicall, and immuscicall. 29            |
| Showres good for Fruits, 135. For some not.      |          | Sounds more apt to procure sleep than Tones      |
| ib. Night-Showers better then Day-showers        | 136      | 31. The Cause. ib. Nature of sounds not suffi-   |
| Showres after a long Drought, cause sicknesses,  |          | ciently inquired. 32. Motions great in Na-       |
| if they be gentle. 172. If great, not. ib.       |          | ture without Sounds. ib. Nullity and Enti-       |
| Sicknesses of the Summer, and the Winter. 84     |          | ty of sounds. ib. 33, 34. Swiftnesse of Moti-    |
| Sight, the Object thereof, quicker than of Hear- |          | on may make sounds inaudible. ib. Sound          |
| ing. 50, 51. Sight. 188, 189. Objects thereof    |          | not an Elision of the Aire. ib. The Reasons      |
| cause great delights in the Spirits, but no      |          | thereof. 35. Sounds not produced without         |
| great offence. ib. The Cause. ib.                |          | some Locall Motion of the Medium. ib. Yet        |
| Silver more easily made then Gold. 71, 72        |          | Distinction to be made, betwixt the Motion       |
| Simples speciall for Medicines. 141, 142. Such   |          | of the Ayre, and the sounds themselves. ib. 36   |
| as have subtile parts without Acrimony. ib.      |          | Great sounds cause great motions in the ayre,    |
| Many Creatures, bred of Putrefaction are so      |          | and other Bodies. ib. Have rarified the Aire     |
| ib. Also Putrefactions of Plants. ib.            |          | much. ibid. Have caused Deafnesse. ib. En-       |
| Singularities in severall Plants. 138            |          | closure of sounds conserueth them. ibid.         |
| Sinking of Bodies. 163. The Cause. ib.           |          | Sounds partly enclosed, and partly in open       |
| Sitting Healthfull. 154                          |          | Aire. ib. Better heard from without, than        |
| Skull. 157                                       |          | from within. ibid. A Semi-Concave will           |
| Sleepe a great Nourisher. 15. Sleepe, 156, 157.  |          | convey sound better than open Aire. ib. Any      |
| Hindered by cold in the feet. ib. Furthered by   |          | long Pole will doe the like. ibid. Triall        |
| some kinde of Noyse. ib. Nourisheth in many      |          | to be made in a Crooked Concave. ib.             |
| Beasts, and Birds. ib. Sleeping Creatures all    |          | Sounds may be created without Aire. 37.          |
| Winter. 194                                      |          | Difference of sounds, in different Vessels,      |
| Sleeping Plants. 128                             |          | filled with Water. ibid. Sound within a          |
| Smells and Odours. 86. Best at some distance,    |          | Flame. ibid. Sound upon a Barrell emp-           |
|                                                  |          | tier or fuller. ibid. Sound not created be-      |
|                                                  |          | twixt the Bow, and the string, But betwixt       |
|                                                  |          | the String and the Aire. ibid.                   |
|                                                  |          | Magni-                                           |



## contained in these Centuries.

**Magnitude of Sounds,** 45. In a Trunke, ib. The Cause thereof, ib. In an Hunters Horne bigger at the lower End, 38. The Cause thereof, ib. In a Vault under the Earth, ib. The Cause thereof, ib. In Hawkes Bells, rather than upon a peice of Brasse in the open Aire, ib. In a Drumme, ib. Further heard by Night, than by Day, ib. The Cause thereof, ib. Increased by the Concurrent Reflexion, ib. Increased by the Sound-Board in Instruments, ib. In an Irish Harp, ib. The Cause of the loud Sound thereof, ib. In a Virginall the Lid Shut, ib. In a Concave within a Wall, ib. 38, 39. In a Bow-String, the Horne of the Bow laid to the Eare, ib. 39. The like in a Rod of Iron or Brasse, ib. The like conveyed by a Pillar of Wood, from an Vpper Chamber to a Lower, ib. The like from the bottome of a Well, ib. Five waies of Majoration of Sounds, ib. Exilitie of Sounds through any porous Bodies, ib. 39. Through Water, ib. 40. Strings stopped short, ib. 40. **Damping of Sounds,** ib. With a Soft Body, ib. Iron hot not so Sounding as Cold, ib. Water warme not so sounding in the Fall as Cold, ib. **Loudnesse and Softnesse of Sound** differ from Magnitude and Exilitie, 41. Loudnesse of Sounds, ib. Quicknesse of Percussion Cause of the Loudnesse, ib. **Communication of Sounds,** 41. **Inequality of Sounds,** 42. Unequall Sounds ingrate, ib. Gratesfull, ib. Muscicall and Immuscicall Sounds at pleasure, onely in Men, and Birds, ib. Humming of Bees an unequall Sound, 43. Mettals quenched give an Hissing Sound, ib. **Base and Treble Sounds,** ib. Two Causes of Treble in Strings, ib. Proportion of the Aire percussed, in Treble, and Base, 53. Triall hereof to be made, in the Winding up of a string, ib. 44. In the Distances of Frets, ib. In the Bores of Winde-Instruments, ib. **Interiour and Exteriour Sounds,** 45. Their Difference, ib. Severall kindes of each, ib. **Articulation of Sounds,** 46. Articulate Sounds in every part of the Aire, ib. Winds hinder not the Articulation, ib. Distance hindreth, ib. Speaking under Water hindreth it not, ib. Articulation requireth a Mediocrity of sound, ib. Confounded in a Room over an ar-

ched Vault, ib. **Motions of the Instruments of Speech** towards the Forming of the Letters, ib. Instruments of Voyce which they are, ib. 46, 47. Inarticulate Voyces, and Inanimate Sounds, have a Similitude with divers Letters, ib. **Motions of Sounds,** 49. They move in round, ib. May move in an arched Line, ib. Supposed that Sounds move better downewards, than upwards, ib. 50. Triall of it, ib. **Lasting of Sounds,** ib. Sounds continue not, but renew, ib. Great Sounds heard at farre Distance, ib. Not in the Instant of the Sound, but Long after, ib. Object of Sight quicker then Sound, 50, 51. Sounds vanish by degrees, which the Objects of Sight doe not, ib. The Cause thereof, ib. **Passage of Sounds through other Bodies,** 51. The Body intercepting must not be very thicke, ib. The Spirits of the Body intercepting, whether they co-operate in the Sound, ib. Sound not heard in a long downe right Arch, ib. Passeth easily through Foraminous Bodies, ib. Whether diminished in the Passage through small Crannies, 52. **Medium of Sounds,** ib. Aire the best Medium, ib. Thin Aire not so good as thicke Aire, ib. Whether Flame a fit Medium, ib. Whether other Liquours beside Water, ib. **Figures of the Diferents of Sounds,** 52. Severall Tryals of them, ib. **Mixture of Sounds,** 53. Audibles mingle in the Medium, which Visibles doe not, ib. The Cause thereof, ib. Mixture without distinction makes the best Harmony, ib. Qualities in the Aire have no Operation upon Sounds, ib. Sounds in the Aire alter one another, 54. Two Sounds of like Loudnesse, will not be heard as farre againe, as one, ib. The Cause thereof, ib. **Melioration of Sounds,** 55. Polished Bodies creating Sounds, meliorate them, ib. Wet on the Inside of a Pipe doth the like, ib. Frosty Weather causeth the same, ib. Mingling of Open Aire, with Pent Aire, doth the same, ib. From a Body Equall Sound better, 55. **Intension of the Sense of Hearing** meliorateth them, ib. **Imitation of Sounds,** ib. The Wonder thereof, in Children, and Birds, ib. **Reflexion of Sounds,** 56. The severall kinds, ib. No Refraction in Sounds observed, 58



## A Table of the Chiefe Matters

|                                                         |                                                        |
|---------------------------------------------------------|--------------------------------------------------------|
| <i>Sympathy and Antipathy of Sounds, 61. Con-</i>       | <i>Starres lesser obscured a Signe of Tempests.</i>    |
| <i>cords, and Discords in Musicke, are Sympa-</i>       | 174                                                    |
| <i>thies and Antipathies of Sounds, ib. Strings</i>     | <i>Sterilitie of the Teare changeth Corne into a-</i>  |
| <i>that best agree in Consort, ib. Strings tun-</i>     | <i>nother kinde.</i>                                   |
| <i>ned to an Vnison, or Diapason, shew a Sym-</i>       | 111                                                    |
| <i>pathy, 62. Sympathy conceived to cause no</i>        | <i>Stomach the Appetite thereof, 176. The Qua-</i>     |
| <i>report, ib. Experiment of Sympathy, to be</i>        | <i>lities that provoke Appetite, ib. The foure</i>     |
| <i>transferred to Winde-Instruments.</i>                | <i>Causes of Appetite.</i>                             |
| ib.                                                     | ib.                                                    |
| <i>Effence of Sounds Spirituall, 63. Sounds not</i>     | <i>Stone wanting in Plums.</i>                         |
| <i>Impressions in the Aire.</i>                         | 110                                                    |
| ib.                                                     | <i>Stretching a Motion of Imitation.</i>               |
| <i>Causes of the suddaine Generation and peri-</i>      | 65                                                     |
| <i>shing of Sounds.</i>                                 | <i>Stub old putting forth a Tree of a better kind.</i> |
| ib.                                                     | 111                                                    |
| <i>Conclusion touching Sounds.</i>                      | <i>Stutting, 85. Two Causes thereof.</i>               |
| 63                                                      | ib.                                                    |
| <i>Sourenesse in Fruits and Liquours, 187. The</i>      | <i>Subterrany Fires.</i>                               |
| <i>Cause of each, ib. Souring of Liquors in the</i>     | 80                                                     |
| <i>Sunne.</i>                                           | <i>Sucking long ill for Children.</i>                  |
| 194                                                     | 78                                                     |
| <i>South-Windes dispose Mens Bodies to Heavi-</i>       | <i>Sugar, 127, 183. The use of it, ib. Draweth Li-</i> |
| <i>nesse, 84. South-Windes hurtfull to Fruit</i>        | <i>quour higher than the Liquour commeth.</i>          |
| <i>blossoming, 135. South-Windes, without</i>           | 21                                                     |
| <i>Raine, breed Pestilence; with Raine, not,</i>        | <i>Sulphureous and Mercuriall.</i>                     |
| <i>166. The Causes, ib. On the Sea-Coasts, not</i>      | 78, 79                                                 |
| <i>so.</i>                                              | <i>Summer and Winter Sickneses, 84. The Prog-</i>      |
| ib.                                                     | <i>nosticks of a dry Summer.</i>                       |
| <i>South-East Sunne better than the South-West</i>      | 174                                                    |
| <i>for Ripening Fruit.</i>                              | <i>Sunne tanneth, which fier doth not, 87, 88. The</i> |
| 90                                                      | <i>Cause.</i>                                          |
| <i>Sparkeling Woods.</i>                                | ib.                                                    |
| 133                                                     | <i>Super-fetation, The Cause of it.</i>                |
| <i>Species Visible.</i>                                 | 116                                                    |
| 160                                                     | <i>Super-plants besides Misseltoe.</i>                 |
| <i>Spirits in Bodies scarce knowne. 26. Severall</i>    | 135                                                    |
| <i>Opinions of them, ib. They are naturall Bo-</i>      | <i>Supporting Plants of themselves, and not Sup-</i>   |
| <i>dies rarified, ib. Causes of most of the Effects</i> | <i>porters.</i>                                        |
| <i>in Nature, ib. They have five differing Ope-</i>     | 122                                                    |
| <i>rations, 73. Spirits in Bodies, 125. How</i>         | <i>Swallowes made white by annointing the Eggs</i>     |
| <i>they differ in Animate and Inanimate, ib.</i>        | <i>with Oyle.</i>                                      |
| <i>How in Plants and Living Creatures, 126.</i>         | 214                                                    |
| <i>Againe of Spirits in Bodies, 181. They are</i>       | <i>Sweat, 148. Parts under the Water, though</i>       |
| <i>of two sorts, ib. Motion of the Spirits exci-</i>    | <i>hot, sweat not, ib. Salt in Taste, ib. Commeth</i>  |
| <i>ted by the Moone, 193. The Strengthening</i>         | <i>more from the upper Parts, than from the</i>        |
| <i>of them prohibiteth Putrefaction.</i>                | <i>lower, ib. More in sleepe, than waking, ib.</i>     |
| 76                                                      | <i>Cold Sweat commonly Mortall, ib. 149.</i>           |
| <i>Spirits of Men fly upon odious Objects, 167.</i>     | <i>Sweat, in what Diseases good, in what</i>           |
| <i>The Transmission of Spirits, 198. Et in se-</i>      | <i>bad, ib. In some Men have beene sweet.</i>          |
| <i>quentib. Transmission of them from the</i>           | 2                                                      |
| <i>Minds of Men, 205, 206, 207, 208, 209, 210</i>       | <i>Sweet Mosse, 114, 132. Sweetnesse of Odour</i>      |
| <i>211. Such Things as comfort the Spirits by</i>       | <i>from the Raine-Bow, 176. Sweetnesse of</i>          |
| <i>Sympathy, 211, 212. The Strife of the Spi-</i>       | <i>Odour whether not in some Water, 176. In</i>        |
| <i>rits best helped by arresting them for a time.</i>   | <i>Earth, found, ib. Sweet Smells, 177. Seve-</i>      |
| 212                                                     | <i>rall Properties of them, ib. They have a Cor-</i>   |
| <i>Sponges.</i>                                         | <i>poreall substance.</i>                              |
| 147                                                     | ib.                                                    |
| <i>Springs of Water made by Art.</i>                    | <i>Sweetnesse in Fruits, and Liquors, 887. The</i>     |
| 6                                                       | <i>Cause of each, ib. Sweet things commixed</i>        |
| <i>Spring-Water.</i>                                    | <i>prohibit Putrefaction.</i>                          |
| 87                                                      | 76                                                     |
| <i>Sprouting of Plants with Water onely</i>             | <i>Swelling how caused in the body. 74 How it</i>      |
| 133                                                     | <i>may be kept downe. 187. Why it followeth</i>        |
| <i>Squill good to set Kernells, or Plum-stones in.</i>  | <i>upon Blowes and Bruises.</i>                        |
| 96                                                      | ib.                                                    |
| <i>Stags Heart with a Bone in it.</i>                   | <i>Swelling of Graines upon Boyling. 185. The</i>      |
| 157                                                     | <i>Cause of the different Swelling them.</i>           |
| <i>Stanchers of Bloud.</i>                              | ib.                                                    |
| 213                                                     | <i>Swimming of Bodies. 163, 166, 167. The cause.</i>   |
|                                                         | 163                                                    |
|                                                         | <i>Swines-Dung dulcorateth Fruit. 98. The</i>          |
|                                                         | <i>cause, ib.</i>                                      |
|                                                         | Swinging                                               |



## contained in these Centuries.

Swinging of Bottles, 68. The use of it. ib.  
 Swoundings. 203  
 Sylva Sylvarum, The Intention of it, 24, 25  
 Sympathy and Antipathy, 25. Sympathy in  
 Plants, 98. Sympathy & Antipathy of Plants  
 103, 102, 103, 104.  
 Sympathy, 211. Instances thereof, ib. 213, 214.  
 Sympathy secret betweene Persons neare in  
 Blood, 215. Betweene great Friends in ab-  
 sence, ib. Sympathy betwixt Multitudes,  
 ib. Sympathy of individuals. 216, 217

### T.

**T**rees of Trees. 128  
 Teeth, 141, 157. Their tenderneſs, 128. Teeth  
 set on Edge by harsh Sounds, 145. The Cause,  
 ib. Sinnewes in them, the Cause of their  
 Paine, not the Marrow, 158, 159. Their ſe-  
 verall Kinds, ib. Difference in ſeverall Crea-  
 tures, ib. Horned Beaſts have no upper  
 Teeth, ib. Tooth the Marke of Horſes Age, ib.  
 At what Age they come forth in Men, ib.  
 What things hurt them, ib. Chiefeſt Conſi-  
 derations about the Teeth, 158. Reſtitution  
 of Teeth in age, ib. Whether it may be done,  
 or no. ib.  
 Tempeſts their Predictions. 174  
 Tenſile Bodies. 181, 182  
 Terra Lemnia. 147  
 Terra Sigillata Communis. 147  
 Thoſes. 138  
 Thistle downe flying in the Aire fore-ſheweth  
 Wind. 175  
 Timber, 134. The ſeverall Natures thereof, ib.  
 The ſeverall Uſes, according to the nature of  
 the Trees. 135  
 Time and Heate worke the like Effects, 65.  
 Their different Operations in many Things.  
 ib.  
 Titillation, 161. The Cause of it, ib. Enduceth  
 Laughing, ib. Of the Noſthrils cauſeth Sneez-  
 ing. ib.  
 Toad-ſtoole. 115  
 Tobacco, 185, 203. Engliſh Tobacco how it may  
 be mended. 185  
 Tones, 29. Leſſe apt to procure Sleep, than  
 Sounds, 31. The Cause why. ib.  
 Tongue ſheweth readily inward Diſeaſes. 141  
 Torpedo Marina. 216  
 Tough Bodies, 180, 181. The Cause. ib.  
 Transmission of Spirits, 198. Et in Seq. Eight

kinds of Transmiſſions of Spirits, 199, 200  
 201. As of the aieri parts of bodies, ib. Of ſpi-  
 rituall Species, ib. Of ſpirits cauſing Attra-  
 ction, ib. Of ſpirits working by the Primi-  
 tive Nature of Matter. ib. Of the Spirits  
 of the Minde of Man, ib. Of the Influxes of  
 the Heavenly Bodies. ib. In Operations of  
 Sympathy, ib. By Sympathy of Individuals.  
 ibid.  
 Trees planted warme, 98. Houſing of them, 92  
 Heape of Flint laid at the bottome helpeth  
 the growth, 93. Shaking hurteth the young  
 Tree; A growne Tree, not, ib. Cutting a-  
 way of Suckers helpeth them. ib. How to  
 plant a Tree, that may grow faire in one  
 yeare, 94. Helped by Boaring a Hole thorow  
 the Heart of the Stocke. ib. By ſlitting the  
 Rootes, ib. By ſpreading upon a wall, ib. By  
 plucking off ſome Leave. ib. By digging  
 yearely about the Rootes, 95. By applying  
 new Moulds. ib. By removing to better  
 Earth, ib. By Slicing their Barke. ib. In  
 ſome kindes, by Shade, ib. By ſetting the  
 Kernels or Stones, in a Squill growing. ib.  
 96. By pulling off ſome Bloſſomes. ib. By  
 cutting off the Top, when they begin to  
 Bud. 97. By Boaring them through the  
 Trunke, and putting in Wedges of hott  
 Woods, ib. By ſeverall applications to the  
 Rootes, ib. By Terebration againe, 98. The  
 Cause thereof, ib. By letting them blood, ib.  
 Grow beſt, fenced from Sunne, and Winde.  
 99. Causes of their Barrenneſſe. ib. Helpeſ  
 to make Trees fruitfull. 100. Tree blowne  
 up by the Roots, and replaced, proved fruit-  
 full. 95. Triall of watering a Tree with  
 warme water. 97. Trees that grow beſt  
 without Graſting, ib. Fruit-Tree Graſted  
 upon a moiſter Stocke, will grow larger. 97  
 Trees removed, to be coaſted as before, ib.  
 Lower boughes bring the bigger Fruit. ib.  
 Trees apparelled with Flowers 108. Forming  
 of Trees into ſeverall Shapes. ib.  
 Transmutation of Trees and Plants, 110. Six  
 Deſignations thereof. ib. 112, 113  
 Trees in Copice-Woods grow more ſtraight. 113  
 The cauſe thereof. ib.  
 Trees full of Heat grow Tall, ib. The Cause. ib.  
 How to Dwarf ſe Trees. ib.  
 Trees that are winders. 113. The cauſe thereof.  
 ib.  
 Trees moiſter yeeld leſſe Moſſe. 114. The cauſe.  
 ib.



## A Table of the Chiefe Matters

Trees in Clay-grounds apt to gather Mosse. *ib.*  
The Cause. *ib.*  
Trees Hide-bound bring forth Mosse. *ib.*  
Trees that ripen latest, blossome earliest. 119  
Trees that last longest. 120. viz. The largest of  
Body. *ib.* Such as bring Mast, or Nuttes. *ib.*  
Such as bring forth Leaves late, and shed  
them late. *ib.* Such as are often cut. *ib.*  
Trees with scattered Boughes. 121. With up-  
right Boughes. *ib.* The Cause of each. *ib.*  
Tree Indian, with Leaves of great Largenesse  
and Fruit without stalkes. 127  
Tree in Persianourished with salt water. 127,  
128  
Trees, commonly fruitfull, but each other  
yeare. 130  
Trees bearing best on the Lower Boughes. 131  
Others on the higher Boughes. *ib.* The Cause  
of each. *ib.* Such as beare best when they are  
old. 131. Others when they are young. *ib.*  
The cause of each. *ib.*  
Trembling in Shadowes. 190  
Trials for wholesome Aires. 164  
Tuft of Mosse on a Briar Bush. 117  
Turkes great Sitters. 156. To them Bathing  
good. *ib.*  
Twice a yeare Fruits. 119  
Tying of the Point. 192, 211  
Tyranny over mens understandings, and Be-  
leefes, much affected. 218

V.

Vapour of Char-coale, or of Seacole, or of  
a Roome new plasted, mortall. 202  
Vapours, which taken outwardly, would con-  
dense the Spirits. 203  
Vegetables rotting upon the Ground. a good  
Compost. 123. Severall Instances thereof. *ib.*  
Venous Bodies. 180  
Venus. 142. In excesse dimmeth the sight. *ib.*  
The Act of it. *ib.* Men more inclined in  
Winter. Women in Summer. 142  
Vermine frighted with the Head of a Wolfe. 213  
Vesuvius. 165  
Vines made fruitfull by applying the Kernels  
of Grapes to the Rootes. 10. The cause  
thereof. *ib.* Made to sprout suddenly with  
Nitre. 96. Love not the Colewort. 101.  
Vine-trees. 128. 129. Anciently of great  
Bodies. *ib.* A tough Wood dry. *ib.* Vines in  
some places not propped. 129

Vine grafted upon Vine. 136  
Vinegar. 194  
Violet-Vinegar. 4  
Visibles hitherto the Subject of Knowledge. 26  
Mingle not in the Medium, as Audibles doe.  
53. The cause thereof. *ib.* Severall Consents  
of Visibles, and Audibles. 58. Severall Dis-  
sents of Visibles and Audibles. 60, 61. Visi-  
ble Species. 160. Visibles & Audibles, 204,  
205. Two Lights of the same Bignesse, will  
not make things be seene as farre againe as  
one. 54. The Cause thereof. *ib.*  
Visuall Spirits infecting. 202, 203  
Vitrioll. 127  
Vivification. 73, 74. The severall things requir-  
ed to Vivification. 143. The Processe of it.  
*ib.* 194, 195.  
Ulcers in the Legge, harder to cure, then in the  
Head. 166. The Cause. *ib.* Difference of Cur-  
ring them, in a French-man, and an Eng-  
lishman. *ib.*  
Unbarkt Branch of a Tree, being set, hath  
growne. 134. Barkt will not. *ib.*  
Vnguentum Teli. 217  
Union, the Force thereof in Naturall Bodies.  
24. Appetite of Union in Naturall Bodies.  
64. Appeareth in three kindes of Bodies. *ib.*  
Voyce, the Shrilnesse thereof. 43. In whom espe-  
cially. *ib.* Why changed at yeares of Puberty.  
*ib.* Labour and Intension, conduceth much  
to imitate Voyces. 56. Imitation of Voyces,  
as if they were at distance. *ib.*  
Urine in quantity, a great Hinderer of Nou-  
rishment. 14

W.

Warmth a speciall meane to make  
Grounds Fruitfull. 123, 124.  
Warts taken away by Lard, or an Elder sticke,  
consuming. 216  
Water thickned in a Cave. 20. Changed sud-  
denly into Aire. 24. Choice of Waters. 86  
By Weight. *ib.* By Boyling. *ib.* By longest  
lasting imputrified. *ib.* By making Drinkes  
Stronger. *ib.* By bearing Soape. *ib.* By the  
places, where they are congregated. 87. By  
the Soyle. *ib.* Waters Sweet not to be tru-  
sted. *ib.* Well-water. *ib.* Water putteth forth  
Herbes without Roots. 117. Water alone  
will cause Plants to sprout. *ib.* Well-water  
warmer in Winter, than Summer. 191. Wa-  
ter rising in a basen, by means of flames. 192



## contained in these Centuries.

- Water hot, and Fire, heat differently, 140. Water  
cooleth Aire, and moisteneth it not, 187,  
188.
- Water may be the Medium of Sound, 167. Wat-  
try Moisture enduceth Putrefaction, 74.  
Turning Watry Substances into Oyle, 79. A  
great Worke in nature ib. Foure Instances  
thereof, ib. 80. Wrought by Digestion, ib.  
Watring of Grounds, a great helpe to fruit-  
fulness, 123, 124. Cautions therein, ib. Means  
to water them. ib.
- Water-Cresses, 78.
- Weapon annointed. 217
- Weight of the Dissolution of Iron in Aqua-for-  
tis. 166
- Wheat set. 95, 96
- White a penurious Colour, 24, 25. In Flowers,  
108. Commonly more Inodorate than other  
Colours, ib. The Cause, ib. White more deli-  
cate in Berries, 109. The Cause thereof, ib.  
Not so commonly in Fruits, ib. The Cause  
thereof. ib.
- White Gunpowder. 42, 43
- Wholesome Seats, 164. Triall for them, 173.  
Moist Aire not good, ib. Inequality of Aire  
nought. ib.
- Wilde-Fyres why Water will not quench them.  
165
- Wilde Herbes shew the Nature of the Ground.  
135
- Winds Southerne dispose Mens bodies to Hea-  
vineesse, 81. Winds Southerne, without Rain,  
feavourish. 166
- Winds gathered for Freshnesse, 164. Prognos-  
ticks of Windes. 174
- Winding Trees. 113
- Wine Burnt, 5. Wine how to be used in Con-  
sumptions, 14. Wine for what Bodies good,  
for what hurtfull, 153. Wine corrected that  
it may not fume. 165
- Wine new, presently made potable. 139
- Wine and Water separated by Weight, 3 4. Tri-  
all hereof in two Glasses, ib. When it will o-  
perate and when not, ib. Spirit of Wine  
burnt, 82. Mingled with Wax, the Operation  
of it. ib.
- Winter and Summer sicknesses, 84. Signes of a  
Cold Winter, 155, 174. Winter Sleepers. 194.
- Witches, 198, 199. Worke most by Imagination,  
and Fancy, ib. 208. Witches Oyntment. 213
- Wolfs-Guts applyed to the Belly cure the Cho-  
licke, 213. Head hanged up frighteth Ver-  
mine. ib.
- Wonder, 151. The Impressions thereof. ib.
- Wood Shining in the Darke. 77, 78.
- Wood-Seare. 104
- Wooll attractive of Water, 20, 25. Through a  
Vessell. ib.
- World supposed by some to bee a Living Crea-  
ture. 197, 198
- Wormes foretell Raine. 176
- Wounds, some Applications to them, 139.  
Wounds made with Brasse, easier to cure,  
than with Iron. 166.
- Wrests have a Sympathy with the Head and o-  
ther Parts. 25

Y.

**Y**awning hindreth Hearing, 62. The Cause,  
ib. It is a Motion of Imitation, 65. In  
Tanning dangerous to picke the Eare. 140  
Teares Sterill cause Corne to degenerate.  
111

Tellow Colour in Herbs. 109

Young Trees, which beare best. 131

Z.

**Z**ones torride, lesse tollerable for Heats  
than the Equinoctiall, 87. Three Causes  
thereof. ib.

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His Lo<sup>ps</sup>. Vsual Receipt for the Gout, to which  
the Sixtieth Experiment hath reference, was this.

To be taken in this Order.

1. The Pultasse.

Rx. Of Manchett, about 3. Ounces, the Crumme onely, thin cut ; Let it bee  
boyled in Milk, till it grow to a Pulp. Adde, in the end, a Dramme, and  
an halfe, of the powder of Red Roses.

Of Saffron 10. Graines.

Of Oyle of Roses an Ounce.

Let it be spread upon a Linnen Cloth, and applied luke-warme ; And  
continued for three Houres space.

2. The Bath, or Fomentation.

Rx. Of Sage- Leaves, halfe a handfull.

Of the Root of Hemlock, Sliced, 6. Drams.

Of Briony Roots, halfe an Ounce.

Of the Leaves of Red Roses, 2. Pugills.

Let them be boyled in a pottle of Water, wherein Steele hath beene  
quenched, till the Liqueur come to a quart. After the Straining, put  
in halfe a handfull of Bay-Salt.

Let it be used, with Scarlet Cloth or Scarlet Wooll, dipped in the Li-  
quour, hot, and so renewed seven times ; All in the space of a quarter  
of an Houre, or little more.

3. The Plaster.

Rx. Emplastrum Diacalcitcos, as much as is sufficient, for the part you  
meane to cover. Let it be dissolved with Oyle of Roses, in such a Con-  
sistence, as will sticke ; And spread upon a peece of Holland, and applied.



His Low Vtall Receipt for the Gout to which  
the sixteenth Experiment hath reference, was this.

To be taken in this Order.

1. The Plaster.

R. Of Marshmall, about 3 Onnces, the Crumme only, thin cut. Let it be  
boyled in Milk, till it grow to a Pulp. Adde, in the end a Dramme, and  
an halfe of the powder of Red Roses.  
Of Saffron 10. Graines.  
Of Oyle of Roses an Onnce.  
Let it be spread upon a Linnen Cloth, and applied like-waimes; And  
continued for three Hours space.

2. The Bath, or Fomentation.

R. Of Sage Leaves, halfe a handfull.  
Of the Root of Hemlock, sliced, a Dramme.  
Of Briary Root, halfe an Onnce.  
Of the Leaves of Red Roses 2. Pagills.  
Let them be boyled in a bottle of Urine, wherein Steele hath bene  
quenched, till the liquor come to a quart after the straining, put  
in halfe a handfull of Bay-Sale.  
Let it be used, with Scarlet Cloth or Scarlet Wooll, dipped in the Li-  
quor, hot, and so renewed 3. or 4. times; All in the space of a quarter  
of an Hour, or little more.

3. The Plaster.

R. Emplastrum Discalceos, as much as is sufficient, for the part you  
meane to cover. Let it be dissolved with Oyle of Roses, in such a Con-  
sistence as will stick; And spread upon a peece of Holland, and applied.



NEVV  
ATLANTIS.

A Worke unfinished.

Written by the Right Honourable, FRANCIS,  
*Lord Verulam, Viscount St. Alban.*

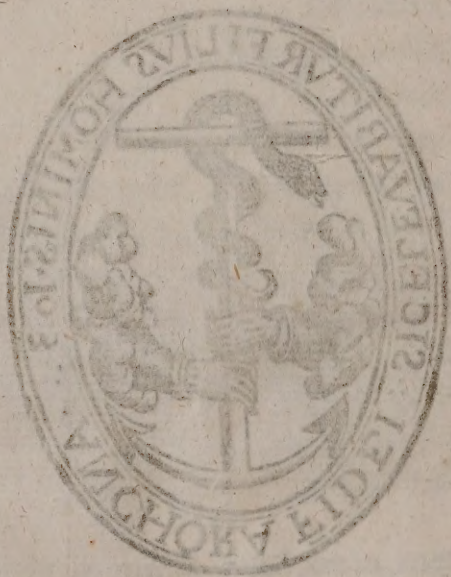




NEW  
ATLANTIS.

A Worke unfinished.

Written by the Right Honourable FRANCIS  
Lord Verulam, Viscount St. Alban.







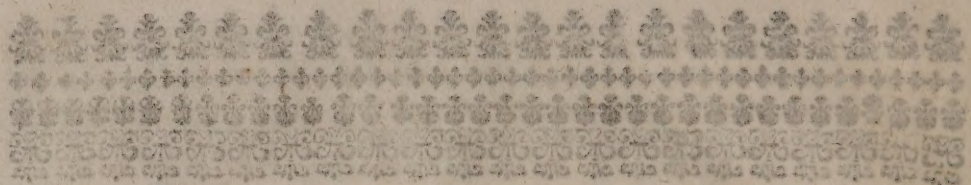
## To the Reader.

**H**is *Fable* my *Lord* devised, to the end that Hee might exhibit therein, a *Modell* or *Description* of a *College*, instituted for the *Interpreting* of *Nature*, and the *Producing* of *Great* and *Marvellous Workes*, for the *Benefit* of *Men*; Vnder the Name of *Salomons House*, or the *College of the Six Dayes Workes*. And even so farre his *Lordship* hath proceeded, as to finish that Part. Certainly the *Modell* is more *Vast*, and *High*, than can possibly be imitated in all things; Notwithstanding most Things therein are within Mens Power to effect. His *Lordship* thought also in this present *Fable*, to have composed a *Frame* of *Lawes*, or of the *best State* or *Mould* of a *Common-wealth*; But fore-seeing it would be a long *VVork*, his Desire of Collecting the *Naturall History* diverted him, which He preferred many degrees before it.

This *VVorke* of the *New Atlantis* (as much as concerneth the *English Edition*) his *Lordship* designed for this place; In regard it hath so neare *Affinitie* (in one part of it) with the *Preceding Naturall History*.

W. Rawley.





## To the Reader.

**T**his Fable my Lord devised, to the end that Hee might exhibit therein a Modell or Description of a College, instituted for the interpreting of Nature, and the Producing of Great and Marvellous Works, for the Benefit of Mankind; Under the Name of Solomon House, or the College of the Six Days Works. And even so farre his Lordship hath proceeded, as to finish that Part. Certainly the Modell is more Vast and High, than can possibly be imitated in all things; Norwithstanding most Things therein are within Mens Power to effect. His Lordship thought also in this present Fable, to have composed a Frame of Labour, or of the best State or Mould of a Common-wealth; But foreseeing it would be a long Work, his Desire of Collecting the several History diverted him, which He preferred many degrees before it.

This Worke of the *Yew Atlas* (as much as concerneth the English Edition) his Lordship designed for this place; In regard it hath so neare Affinitie (in one part of it) with the Preceding *Natural History*.

W. Brouncker.





## NEW ATLANTIS



WE sailed from *Pera*, (where we had continued by the space of one whole yeare,) for *China* and *Iapan*, by the South Sea; taking with us Victuals for twelve Moneths; And had good Winds from the East, though soft and weake, for five Moneths space and more. But then the Wind came about, and settled in the West for many dayes, so as we could make little or no way, and were sometimes in purpose to turne backe. But then againe there arose Strong and Great winds from the South, with a Point East; which carried us up, (for all that we could doe) towards the North: By which time our Victuals failed us, though wee had made good spare of them. So that finding our selves, in the Midst of the greatest Wildernesse of waters in the world, without Victuall, wee gave our Selves for lost Men, and prepared for death. Yet we did lift up our Hearts and Voices to GOD above, *who sheweth his Wonders in the Deepe*; Beseeching him of his Mercy, that as in the *Beginning* He discovered the *Face* of the *Deepe*, and brought forth *Drie-Land*; So he would now discover Land to us, that we mought not perish. And it came to passe, that the next day about Evening, we saw within a Kenning before us, towards the North, as it were thicke-Clouds, which did put us in some hope of Land; Knowing how that part of the South-Sea was utterly unknowne; And might have Islands or Continents, that hitherto were not come to light. Wherefore we bent our course thither, where wee saw the appearance of Land, all that night; And in the Dawning of the next Day, wee might plainly discern that it was a Land, Flat to our sight, and full of Boscage; which made it shew the more Darke. And after an Houre and a halfe Sayling, wee entered



tred into a good *Hauen*, being the Port of a faire *City*: Not great indeed, but well built, and that gave a pleasant view from the Sea: And we thinking every Minute long, till wee were on Land, came close to the Shore and offered to land. But straightwayes wee saw divers of the People, with Bastons in their Hands, (as it were) forbidding vs to land; Yet without any Cryes or Fiercenesse, but only as warning vs off, by Signes that they made. Whereupon being not a little discomfited, wee were advising with our selves, what wee should doe. During which time, there made forth to us a small Boat, with about eight Persons in it; whereof One of them had in his Hand a Tipstaffe of of a yellow Cane, tipped at both ends with Blew, who made aboard our Ship, without any shew of Distrust at all. And when he saw one of our Number, present himselfe somewhat afore the rest, hee drew forth a little Scroule of Parchment (somewhat yellower than our Parchment, and shining like the Leaves of Writing Tables, but otherwise soft and flexible,) and delivered it to our formost Man. In which Scroule were written in Ancient Hebrew, and in Ancient Greeke, and in good Latine of the Schoole, and in Spanish these words; *Land ye not, none of you, and provide to be gone, from this Coast, within sixteen dayes, except you have further time given you: Meane-while, if you want Fresh Water, or Victuall, or helpe for your Sicke, or that your Ship needeth repaire, write downe your wants, and you shall have that which belongeth to Mercy.* This Scroule was signed with a Stamp of Cherubims Wings, not spred, but hanging downwards; And by them a Crosse. This being delivered, the Officer returned, and left onely a Servant with us to receive our Answer. Consulting hereupon amongst our Selves, wee were much perplexed. The Deniall of Landing, and Hasty Warning us away, troubled us much; On the other side, to finde that the People had Languages, and were so full of Humanity, did comfort us not a little. And above all, the Signe of the Crosse to that Instrument, was to us a great Rejoycing, and as it were a certaine Presage of Good. Our Answer was in the Spanish tongue; *That for our Ship, it was well; For we had rather met with Calmes and contrary winds, than any Tempests. For our Sicke, they were many, and in very ill Case; So that if they were not permitted to Land, they ranne in danger of their Lives.* Our other Wants wee set downe in particular, adding; *That we had some little store of Merchandize, which if it pleased them to deale for, it might supply our Wants, without being chargeable*



ble unto them. Wee offered some Reward in Pistolets unto the Servant, and a peece of Crimson Velvet to bee presented to the Officer: But the Servant tooke them not, nor would scarce looke upon them; And so left us, and went back in another little Boat which was sent for him.

About three Houres after wee had dispatched our Answer, there came towards us, a Person (as it seemed,) of place. Hee had on him a Gowne with wide Sleeves, of a kinde of Water Chamolet, of an excellent Azure Colour, farre more glossy than ours: His under Apparell was greene; and so was his Hat, being in the forme of a Turban, daintily made, and not so huge as the *Turkish* Turbans; And the Locks of his Haire came down below the Brimmes of it. A Reverend Man was he to behold. Hee came in a Boat, gilt in some part of it, with foure Persons more onely in that Boat; And was followed by another Boat, wherein were some Twenty. When hee was come within a Flight-shot of our Ship, Signes were made to us, that we should send forth some to meet him upon the water, which we presently did in our Ship-Boat, sending the principall Man amongst us save one, and foure of our Number with him. When wee were come within sixe yards of their Boat, they called to us to stay, and not to approach further, which we did. And thereupon the Man, whom I before described, stood up, and with a loud voice in *Spanish*, asked, *Are ye Christians?* Wee answered; *We were*; fearing the lesse, because of the *Crosse* we had seene in the Subscription. At which Answer the said Person lift up his Right Hand towards Heaven, and drew it softly to his Mouth (which is the Gesture they use, when they thanke *G O D*;) And then said: *If ye will swear, (all of you,) by the Merits of the SAVIOUR, that ye are no Pirates; Nor have shed blood, lawfully, nor unlawfully, within forty dayes past; you may have License to come on Land.* Wee said; *We were all ready to take that Oath.* Whereupon one of those that were with him, being (as it seemed) a Notary, made an Entry of this Act. Which done, another of the Attendants of the Great Person, which was with him in the same Boat, after his Lord had spoken a little to him, said aloud; *My Lord would have you know, that it is not of Pride, or Greatnesse, that he commeth not aboard your Ship; But for that, in your Answer, you declare, that you have many Sicke amongst you, he was warned by the Conservatour of Health, of the City, that hee should keepe a distance.* Wee bowed our selves towards him, and answered; *Wee were*



were his humble Servants; And accounted for great Honour, and singular Humanitie towards us, that which was already done; But hoped well, that the Nature of the Sicknesse, of our Men, was not infectious. So he returned; And a while after came the Notary to us aboard our Ship; Holding in his hand a Fruit of that Country, like an Orenge, but of colour between Orenge-tawny and Scarlet; which cast a most excellent Odour. Hee used it (as it seemeth) for a Preservative against Infection. He gave us our Oath; *By the Name of Jesus, and his Merits*: And after told us, that the next day by sixe of the Clocke in the Morning, wee should be sent to, and brought to the *Strangers House*, (so hee called it,) where we should be accommodated of things, both for our Whole, and for our Sicke. So he left us; And when we offered him some Pistolets, he smiling, said; *Hee must not bee twice paid for one Labour*: Meaning (as I take it) that he had Salary sufficient of the State for his Service. For (as I after learned) they call an Officer that taketh Rewards, *Twice-paid*.

The next Morning early, there came to us the same Officer, that came to us at first with his Cane, and told us; *Hee came to conduct us to the Strangers House*; And that he had prevented the Houre, because we might have the whole day before us, for our Business. For (said hee) *If you will follow my Advice, there shall first goe with me some few of you, and see the place, and how it may be made convenient for you; And then you may send for your Sick, and the rest of your Number, which ye will bring on Land*. Wee thanked him, and said; *That this Care, which he tooke of desolate Strangers, GOD would reward*. And so sixe of us went on Land with him: And when wee were on Land, hee went before us, and turned to us, and said; *He was but our Servant, and our Guide*. Hee led us through three faire Streets; And all the Way wee went, there were gathered some People on both sides, standing in a Row; But in so civill a fashion, as if it had beene, not to wonder at us, but to welcome us; And divers of them, as wee passed by them, put their Armes a little abroad; which is their Gesture, when they bid any welcome. The *Strangers House* is a faire and spacious House, built of Brick, of somewhat a blewish Colour than our Brick; And with handsome Windows, some of Glasse, some of a kinde of Cambrick oyled. Hee brought us first into a faire Parlour above staires, and then asked us; *What number of Persons we were? And how manie sicke?* we answered, *WVe were in all (sicke and whole) one and fiftie Persons, whereof*



our sicke were *seventene*. He desired us to have patience a little, and to stay till he came backe to us; which was about an Houre after; And then he led us to see the Chambers, which were provided for us, being in number *nineteene*. They having cast it (as it seemeth) that foure of those Chambers, which were better than the rest, might receive four of the principall Men of our Company; And lodge them alone by themselves; And the other *fifteene* Chambers were to lodge us, two and two together. The Chambers were handsome and chearefull Chambers, and furnished civilly. Then he led us to a long Gallery, like a Dorture, where hee shewed us all along the one side (for the other side was but wall and window,) *seventene* Cells, very neat ones, having partitions of Cedar wood. Which Gallery, and Cells, being in all forty, (many more than we needed,) were instituted as an Infirmary for sick Persons. And he told us withall, that as any of our Sick waxed well, hee might bee removed from his Cell, to a Chamber: For which purpose there were set forth ten spare Chambers, besides the Number we spake of before. This done, he brought us backe to the Parlour, and lifting up his Cane a little, (as they do when they give any Charge or Command) said to us; *Tee are to know that the Custome of the Land requireth, that after this day, and to morrow, (which we give you for removing your People from your Ship,) you are to keepe within doores for three daies. But let it not trouble you, nor doe not thinke your selves restrained, but rather left to your Rest and Ease. You shall want nothing, and there are sixe of our People appointed to attend you, for any Businesse you may have abroad.* Wee gave him thankses, with all Affection and Respect, and said; *G O D surelie is manifested in this Land.* We offered him also twenty Pistolets; But he smiled, and onely said; *What? Twice Paid!* And so hee left us. Soone after our Dinner was served in; Which was right good Viands, both for Bread, and Meat: Better than any Collegiate Diet, that I have knowne in *Europe*. We had also Drinke of three sorts, all wholesome and good; Wine of the Grape; A Drinke of Graine, such as is with us our Ale, but more cleare: and a kind of Sider made of a fruit of that Countrey; A wonderful pleasing and Refreshing Drink. Besides, there were brought in to us, great Store of those Scarlet Orenge, for our Sicke; which (they said) were an assured Remedy for sicknesse taken at Sea. There was given us also, a Box of small gray, or whitish Pills, which they wished our Sicke should take, one of the Pills



every night before sleep ; which ( they said ) would hasten their Recovery. The next day, after that our Trouble of Carriage, and Removing of our Men, and Goods out of our Ship, was somewhat settled and quiet, I thought good to call our Company together ; and when they were assembled, said unto them ; *My deare Friends ; Let us know our selves, and how it standeth with us. We are Men cast on Land, as Jonas was, out of the Whales Belly, when we were as buried in the Deepe : And now wee are on Land, we are but betweene death and Life ; For wee are beyond, both the Old World and the New ; And whether ever we shall see Europe, GOD onely knoweth. It is a kinde of Miracle hath brought us hither : And it must be little lesse, that shall bring us hence. Therefore in regard of our Deliverance past, and our danger present, and to come, let us looke up to GOD, and every man reforme his owne waies. Besides we are come here amongst a Christian People, full of Pietie and Humanity : Let us not bring that Confusion of face upon our selves, as to shew our vices, or unworthinesse before them. Yet there is more : For they have by Commandement, ( though in forme of Courtesie ) Cloystrered us within these Walls for three daies : Who knoweth, whether it be not, to take some taste of our manners and conditions ? And if they finde them bad, to banish us straight-waies ; if good, to give us further time. For these Men, that they have given us for Attendance, may withall have an eye upon us. Therefore for GODS love, and as wee love the weale of our Soules and Bodies, let us so behave our selves, as we may be at peace with GOD, and may finde grace in the Eyes of this People. Our Company with one voyce thanked me for my good Admonition, and promised me to live soberly and civilly, and without giving any the least occasion of Offence. So we spent our three dayes joyfully, and without care, in expectation what would be done with us, when they were expired. During which time, we had every houre joy of the Amendment of our Sick ; who thought themselves cast into some Divine Poole of Healing ; They mended so kindly, and so fast.*

The Morrow after our three dayes were past, there came to us a new Man, that we had not seene before, clothed in Blew as the former was, save that his Turban was white with a small red Crosse on the Topp. Hee had also a Tippet of fine Linnen. At his Comming in, he did bend to us a little, and put his Armes abroad. We of our Parts saluted him in a very lowly and submissive manner ; As looking that from him we should receive Sentence of Life, or Death. Hee desired to speake with

some



some few of us : Whereupon sixe of us onely stayed, and the rest avoided the Roome. He said; *I am by Office Governour of this House of Strangers, and by Vocation I am a Christian Priest;* And therefore am come to you, to offer you my service, both as Strangers, and chiefly as Christians. Some things I may tell you, which I think you will not be unwilling to heare. The State hath given you Licence to stay on Land for the space of sixe weeks: And let it not trouble you, if your occasions aske further time, for the Law in this point is not precise. And I doe not doubt, but my selfe shall be able to obtaine for you such further time, as may be convenient. Tee shall also understand, that the Strangers House, is at this time Rich, and much aforehand. For it hath laid up Revenew these 37. yeares: For so long it is since any Stranger arrived in this part: And therefore take ye no care. The State will defray you all the time you stay: Neither shall you stay one day the lesse for that. As for any Merchandize you have brought, ye shall be well used, and have your returne, either in Merchandize, or in Gold and Silver: For to us it is all one. And if you have any other Request to make, hide it not. For ye shall finde, we will not make your Countenance to fall, by the answer ye shall receive. Onely this I must tell you, that none of you must goe above a Karan, (that is with them a Mile and an halfe) from the walls of the Citie, without speciall leave. Wee answered, after wee had looked a while upon one another, admiring this gracious and parent-like usage, That we could not tell what to say: For we wanted words to expresse our Thanks. And his Noble free Offers left us nothing to aske. It seemed to us, that we had before us a picture of our Salvation in Heaven: For we that were a while since in the Lawes of Death, were now brought into a place, where we found Nothing but Consolations. For the Commandement laid upon us, we would not faile to obey it, though it was impossible but our Hearts should be enflamed to tread further upon this Happie and Holie Ground. We added, That our Tongues should first cleave to the Roofes of our Mouthes, ere wee should forget, either his Reverend Person, or this whole nation, in our Prayers. We also most humbly besought him to accept of us as his true servants, by as just a Right, as ever Men on Earth were bounden, laying and presenting, both our Persons, and all we had at his feet. He said; He was a Priest, and looked for a Priests reward, which was our Brotherly love, and the good of our Soules and Bodies. So he went from us, not without Teares of Tenderesse in his Eyes, And left us also confused with joy and kindnesse, saying amongst our selves, That we were come into a land of Angels,



which did appeare to us daily, and prevent us with Comforts, which we thought not of, much lesse expected.

The next day about ten of the Clocke, the Governour came to us againe, and after Salutations, said familiarly; That he was come to visit us; And called for a Chaire, and sat him downe; And we being some ten of us (the rest were of the meaner sort; or else gone abroad;) sate downe with him; And when wee were sett, he began thus. We of this Island of Bensalem (for so they call it in their Language) have this; That by meanes of our solitary Situation; and of the Lawes of Secrecy, which we have for our Travellers, and our rare Admission of Strangers, we know well most part of the Habitable World, and are our selves unknowne. Therefore because he that knoweth least, is fittest to aske Questions, it is more Reason, for the Entertainment of the time, that ye aske mee Questions, than that I aske you. Wee answered; That we humbly thanked him, that he would give us leave so to doe: And that wee conceived by the taste we had already, that there was no worldly thing on Earth, more worthy to bee knowne, than the State of that happy Land. But above all (we said) since that we were met from the severall Ends of the world; and hoped assuredly, that we should meet one day in the Kingdome of Heaven (for that we were both Parts Christians) we desired to know (in respect that Land was so remote, and so divided by vast and unknowne Seas; from the Land, where our SAVIOUR walked on Earth) who was the Apostle of that Nation, and how it was converted to the faith? It appeared in his face, that he tooke great Contentment in this our Question: He said; Tee knit my Heart to you, by asking this Question in the first place; For it sheweth that you First seeke the Kingdome of Heaven; And I shall gladly, and briefly, satisfie your demand.

About twenty Yeares after the Ascension of our SAVIOUR, it came to passe, that there was seene by the people of Rensusa, (a City upon the Easterne Coast of our Island, within night, (the Night was Cloudy and Calme,) as it might be some mile in the Sea, a great Pillar of Light; Not sharpe, but in forme of a Columne, or Cylinder, rising from the Sea, a great way up towards Heaven; and on the topp of it was seene a large Crosse of Light, more bright and resplendent than the Body of the Pillar. Vpon vvvhich so strange a Spectacle, the People of the City gathered apace together upon the Sands, to wonder; And so after put themselves into a number of small Boats to goe nearer to this Marveilous sight. But vvhen the Boats vvere come vvithin (about) sixty yards of the Pillar, they found themselves all bound,



bound, and could goe no further, yet so as they might move to goe about, but might not approach nearer: So as the Boats stood all as in a Theater, beholding this Light, as an Heavenly Signe. It so fell out, that there was in one of the Boats, one of the Wise Men, of the Society of Salomons House; which House or College, (my good Brethren) is the very Eye of this Kingdome; Who having a while attentively and devoutly viewed, and contemplated this Pillar and Crosse, fell downe upon his face; And then raised himselfe upon his knees, and lifting up his Hands to Heaven, made his prayers in this manner.

**L**ord God of Heaven and Earth; thou hast vouchsafed of thy Grace, to those of our Order, to know thy Workes of Creation, and the Secrets of them; And to discern (as farre as appertaineth to the Generations of Men) between Divine Miracles, Workes of Nature, Workes of Art, and Impostures, and Illusions of all sorts. I doe here acknowledge and testifie before this People, that the Thing we now see before our eyes, is thy Finger, and a true Miracle. And for-as-much, as wee learne in our Books, that thou never Workest Miracles, but to a Divine and Excellent End, (for the Lawes of Nature are thine owne Lawes, and thou exceedest them not but upon great cause) we most humbly beseech thee, to prosper this great Signe, And to give us the Interpretation and use of it in Mercy; Which thou dost in some part secretly promise, by sending it untous.

When hee had made his Prayer, he presently found the Boate hee was in, moveable and unbound; whereas all the rest remained still fast; And taking that for an assurance of Leave to approach, hee caused the Boate to be softly, and with silence rowed towards the Pillar. But ere he came neare it, the Pillar and Crosse of Light brake up, and cast it selfe abroad, as It were into a Firmament of many Starres; which also vanished soone after, and there was nothing left to be seene, but a small Arke, or Chest of Cedar, dry, and not wet at



all with vvater, though it swam. And in the Fore-end of it, which was towards him, grew a small greene Branch of Palme; And when the wise man had taken it with all reverence, into his Boat, it opened of it selfe, and there were found in it, a Book, and a Letter; Both written in fine Parchment, and wrapped in Sindons of Linnen. The Book contained all the Canonickall Books of the Old and New Testament, according as you have them; (For we know well what the Churches with you receive;) And the Apocalypse it selfe; And some other Books of the New Testament, which were not at that time vvritten, vv ere neverthelesse in the Booke. And for the Letter, it vv as in these vvords.

**I** Bartholomew, a Servant of the Highest, and Apostle of  $\text{JESVS CHRIST}$ , was warned by an Angell that appeared to me, in a vision of Glory, that I should commit this Arke to the fouds of the Sea. Therefore I doe testifie and declare, unto that People, where  $\text{GOD}$  shall ordaine this Arke to come to Land, that in the same day is come unto them Salvation, and Peace, and Good Will, from the Father, and from the  $\text{LORD JESVS}$ .

There was also in both these Writings, as vvell the Booke, as the Letter, wrought a great Miracle, Conforme to that of the Apostles, in the Originall Gift of Tongues. For there being at that time, in this Land, Hebrews, Persians, and Indians, besides the Natives, every one read upon the Booke, and Letter, as if they had been vvritten in his owne Language. And thus was this Land saved from infidelitie; (as the Remaine of the Old World was from Water) by an Arke, through the Apostolicall and Miraculous Euangelisme of S. Bartholomew. And here he paused, and a Messenger came, and called him forth from us. So this was all that passed in that Conference.

The next Day, the same Governour came againe to us, immediately after Dinner, and excused himselfe, saying; That the Day before he was called from us somewhat abruptly, but now hee would make us amends, and spend time with us, if wee held his Company and Conference agreeable; We answered; That we held it so agreeable and pleasing to us, as wee forgot both Dangers past, and Feares



Feares to come, for the time wee heard him speake; And that wee thought an Houre spent vvith him, was worth Teares of our former life. Hee bowed himselfe a little to us, and after we were sett againe, he said; Well, the Questions are on your part. One of our Number said, after a little Pause; That there was a Matter, wee were no lesse desirous to know, than fearefull to aske, least wee might presume too farre. But encouraged by his rare Humanity towards us, (that could scarce thinke our selves Strangers, being his vowed and professed Servants,) wee would take the Hardinesse to propound it: Humbly beseeching him, if hee thought it not fit to bee answered, that he would pardon it, though he rejected it. We said; We well observed those his words, vvhich he formerly spake, that this happy Island, vvhere we now stood, was knowne to few, and yet knew most of the Nations of the World, vvhich we found to bee true, considering they had the Languages of Europe, and knew much of our State and Business; And yet we in Europe (notwithstanding all the remote Discoveries, and Navigations of this last Age) never heard any of the least Inkleing or Glimpse of this Island. This vve found vvonderfull strange; For that all Nations have Enterknowledge one of another, either by Voyage into Forraine Parts, or by Strangers that come to them: And though the Traveller into a Forreine Countrey, doth commonly know more by the Eye, than he that stayeth at home can by relation of the Traveller; Yet both vvayes suffice to make a mutuall Knowledge, in some degree; on both parts. But for this Island, vvee never heard tell of any Ship of theirs, that had been seen to arrive upon any shore of Europe; No, nor of either the East or West Indies, nor yet of any Ship of any other part of the World, that had made returne from them. And yet the Marvell rested not in this. For the Situation of it (as his Lordship said,) in the secret Conclave of such a vast Sea mought cause it. But then, that they should have Knowledge of the Languages, Bookes, Affaires, of those that lye such a distance from them, it vv as a thing wee could not tell vvhat to make of; For that it seemed to us a condition and Proprietie of Divine Powers and Beings, to be hidden and unseene to others, and yet to have others open, and as in a light to them. At this speech the Governour gave a gracious smile & said; That we did well to ask pardon for this Question we now asked; For that it imported, as if we thought this Land a Land of Magicians, that sent forth Spirits of the Ayre into all parts, to bring them Newes, and Intelligence of other Countries. It was answered by us all, in all possible humblenesse, but yet with a Countenance taking knowledge, that we knew that

hee



he spake it but merrily. That we were apt enough to thinke, there was somewhat supernaturall in this Island, but yet rather as Angelicall, than Magicall. But to let his Lordship know truely, vvhhat it was that made us tender and doubtfull to aske this Question, it vvas not any such conceit, but because wee remembred, hee had given a Touch in his former Speech, that this Land had Lawes of Secrecy touching Strangers: To this he said; You remember it aright: And therefore in that I shall say to you, I must reserve some particulars, vvhich it is not lawfull for me to reveale; but there will be enough left, to give you satisfaction.

You shall understand (that vvhich perhaps you vwill scarce thinke credible) that about three thousand Yeares agoe, or somewhat more, the Navigation of the World (specially for remote Voyages) was greater than at this Day. Doe not thinke with yourselves, that I know not how much it is increased with you, within these threescore Yeares: I know it well; And yet I say, greater then, than now: Whether it was, that the Example of the Arke, that saved the Remnant of Men, from the universall Deluge, gave Men confidence to adventure upon the Waters; Or what it was; but such is the truth. The Phoenicians, and specially the Tyrians, had great Fleets. So had the Carthaginians their Colony, which is yet further West. Toward the East the Shipping of Egypt, and of Palestina, was likewise great. China also, and the great Atlantis, (that you call America) which have now but Iunks, and Canoas, abounded then in tall Ships. This Island, (as appeareth by faithfull Registers of those times) had then fiftene hundred strong Ships, of great content. Of all this, there is with you sparing Memory, or none; But wee have large Knowledge thereof.

At that time, this Land was knowne and frequented by the Ships and Vessels of all the Nations before named. And (as it commeth to passe) they had many times Men of other Countries, that were no Saylers, that came with them; As Persians, Chaldeans, Arabians; So as almost all Nations of Might and Fame resorted hither; Of whom, we have some Stirps, and little Tribes with us; at this day. And for our owne Ships, they went sundry Voyages, as well to your Streights, which you call the Pillars of Hercules, As to other parts in the Atlantique and Mediterrane Seas; As to Paguin, (which is the same with Cambalaine) and Quinzy, upon the Orientall Seas, as farre as to the Borders of the East Tartary.

At the same time, and an Age after, or more, the Inhabitants of the great Atlantis did flourish. For though the Narration and Description



scription which is made by a great Man with you, that the Descen-  
 dents of Neptune planted there; and of the Magnificent Temple,  
 Pallace, City, and Hill; and the manifold streames of goodly Na-  
 vigable Rivers, (which as so many Chaines invironed the same Site,  
 and Temple; And the severall Degrees of Ascent, whereby Men did  
 climbe up to the same, as if it had beene a Scala Cœli; be all Poeti-  
 call and Fabulous: Yet so much is true, that the said Countrey of  
 Atlantis; As well that of Peru then called Coya, as that of Mexi-  
 co then named Tyrambel, were mighty and proud Kingdomes, in  
 Armes, Shipping, and Riches: So mighty, as at one time, (or at least  
 within the space of ten yeares,) they both made two great Expediti-  
 ons; They of Tyrambel through the Atlantique to the Mediter-  
 rane Sea; and they of Coya, through the South Sea upon this our  
 Island: And for the former of these, which was into Europe, the same  
 Author amongst you, (as it seemeth) had some relation from the Æ-  
 gyptian Priest, whom he citeth. For Assuredly, such a thing there  
 was. But whether it were the Ancient Athenians, that had the glory  
 of the Repulse, and Resistance of those Forces, I can say nothing: But  
 certaine it is, there never came backe, either Ship, or Man, from that  
 Voyage. Neither had the other Voyage of those of Coya upon us, had  
 better fortune, if they had not met with Enemies of greater clemency.  
 For the King of this Island, (by name Altabin,) a wise Man, and a  
 great Warriour; Knowing well both his owne strength, and that of his  
 Enemies; handled the matter so, as he cut off their Land-Forces, from  
 their Ships, and entoyled both their Navy, and their Campe, with  
 a greater Power than theirs, both by Sea and Land: And compelled  
 them to render themselves without striking stroke: And after they  
 were at his Mercy, contenting himselfe onely with their Oath, that  
 they should no more beare Armes against him, dismissed them all in  
 safetie. But the Divine Revenge overtooke not long after those proud  
 Enterprises. For within lesse than the space of one Hundred Teares,  
 the Great Atlantis was utterly lost and destroyed: Not by a great  
 Earthquake, as your Man saith; (For that whole Tract is little  
 subject to Earthquakes;) But by a particular Deluge, or Inundati-  
 on; Those Countries having, at this Day, farre greater Rivers,  
 and farre higher Mountaines, to powre downe Waters, than any part of  
 the Old World. But it is true, that the same Inundation was not  
 deepe; Not past forty foot, in most places, from the Ground; So  
 that, although it destroyed Man and Beast generally, yet some few  
 wild Inhabitants of the Wood escaped. Birds also were saved by fly-  
 ing to the High Trees and Woods. For as for Men, although they had  
 Buildings



Buildings in many places, higher than the Depth of the Water; Yet that Inundation, though it were shallow, had a long Continuance; whereby they of the Vale, that were not drowned, perished for want of Food, and other things necessary. So as marvell you not at the thinne Population of America, nor at the Rudenesse and Ignorance of the People; For you must account your Inhabitants of America as a yong People; younger a thousand yeares, at the least, than the rest of the World: For that there was so much time, betweene the Univerfall Floud, and their Particular Inundation. For the poore Remnant of Humane Seed, which remained in their Mountaines, Peopled the Countrey again slowly, by little and little; And being simple and a savage People (Not like Noah and his Sonnes, which was the chiefe Family of the Earth) they were not able to leave Letters, Arts, and Civilitie to their Posteritie; And having likewise in their Mountainous Habitations been used, (in respect of the Extreme Cold of those Regions,) to cloath themselves with the Skinnes of Tygers, Beares, and great Hairy Goats, that they have in those Parts; When after they came downe into the Valley, and found the intolerable Heats which are there, and knew no meanes of lighter Apparell; they were forced to begin the custome of Going Naked, which continueth at this day. Onely they take great pride and delight, in the Feathers of Birds; And this also they tooke from those their Ancestours of the Mountaines, who were invited unto it, by the infinite Flights of Birds, that came up to the high Grounds, while the Waters stood below. So you see, by this maine Accident of Time, wee lost our Traffique with the Americans, with whom, of all others, in regard they lay nearest to us, wee had most Commerce. As for the other Parts of the World, it is most manifest, that in the Ages following, (whether it were in respect of Warres, or by a naturall Revolution of Time,) Navigation did every where greatly decay; And specially, farre Voyages, the rather by the Use of Gallies, and such Vessells as could hardly brooke the Ocean) were altogether left and omitted. So then, that Part of Entercourse, which could bee from other Nations, to Sayle to us; you see how it hath long since ceased; Except it were by some rare Accident, as this of yours. But now of the Cessation of that other Part of Entercourse, which mought bee by our Sayling to other Nations, I must yeeld you some other Cause. For I cannot say, (if I shall say truelie,) but our Shipping, for Number, Strength, Mariners, Pylots, and all things that appertaine to Navigation, is as great as ever; And therefore



therefore why we should sit at home, I shall now give you an account by it selfe; And it will draw nearer, to give you satisfaction, to your principall Question.

There raigned in this Island, about 1900. yeares agoe, a King, whose memory of all others we most adore; Not Superstitiously, but as a Divine Instrument, though a Mortall Man: His Name was Salomona: And we esteeme him as the Law-giver of our Nation. This King had a large heart, inscrutable for good; and was wholly bent to make his Kingdome and People Happy. He therefore taking into Consideration, how sufficient and substantive this Land was, to maintain it selfe without any ayd (at all) of the Forrainer; Being 5600. Mile in Circuit, and of rare Fertility of Soyle, in the greatest part thereof; And finding also the Shipping of this Countrey mought bee plentifully set on worke, both by Fishing, and by Transportations from Port to Port, and likewise by Sayling unto some small Islands that are not farre from us, and are under the Crowne and Lawes of this State; And recalling into his Memory, the happy and flourishing Estate, wherein this Land then was; So as it mought be a thousand wayes altered to the worse, but scarce any one way to the better; thought nothing wanted to his Noble and Heroicall Intentions, but onely (as farre as Humane foresight mought reach) to give perpetuity to that, which was in his time so happily established. Therefore amongst his other Fundamentall Lawes of this Kingdome, he did ordaine, the Interdicts and Prohibitions, which wee have touching Entrance of Strangers; which at that time (though it was after the Calamity of America) was frequent; Doubting Novelties, and Commixture of Manners. It is true, the like Law, against the Admission of Strangers without License, is an ancient Law, in the Kingdome of China, and yet continued in use. But there it is a poor Thing; And hath made them a curious, ignorant, fearefull, foolish Nation. But our Law-giver made his Law of another temper. For first, he hath preserved all points of Humanity, in taking Order, and making Provision for the Reliefe of Strangers distressed; whereof you have tasted. At which Speech (as reason was) wee all rose up, and bowed our selves. He went on. That King also still desiring to joyne Humanity and Policy together; And thinking it against Humanity, to detaine Strangers here against their wills; And against Policy, that they should returne, and discover their knowledge of this Estate, He tooke this Course: Hee did ordaine, that of the Strangers, that should be permitted to Land, as many (at all times) mought depart as many as would; But as many as would stay, should have very good Conditions, and Meanes to live,



from the State. Wherein he saw so farre, that now in so many Ages since the Prohibition, we, have memory, not of one Ship that ever returned, and but of thirteen Persons onely, at severall times, that chose to returne in our Bottomes. What those few that returned, may have reported abroad, I know not. But you must thinke, Whatsoever they have said, could be taken where they came, but for a Dreame. Now for our Travelling from hence into Parts abroad, our Law-giver thought fit, altogether to restraine it. So is it not in China. For the Chineses sayle where they will, or can, which sheweth, that their Law of Keeping out Strangers, is a Law of Pusillanimity, and feare. But this restraint of ours, hath one onely Exception, which is admirable; Preserving the good which commeth by communicating with Strangers, and avoiding the Hurt; And I will now open it to you. And here I shall seeme a little to digresse, but you will by and by finde it pertinent. Ye shall understand, (my deare Friends,) that amongst the Excellent Acts of that King, one above all hath the preheminance. It was the Erektion, and Institution of an Order, or Societic, which we call Salomons House; The Noblest Foundation, (as wee thinke,) that ever was upon the Earth; And the Lanthorne of this Kingdome. It is dedicated to the Study of the Workes and Creatures of GOD. Some thinke it beareth the Founders Name a little corrupted, as if it should be Solamona's House. But the Records write it, as it is spoken. So as I take it to be denominate of the King of the Hebrewes, which is famous with you, and no Stranger to us; For wee have some Parts of his Workes, which with you are lost; Namely that Naturall History, which he wrote of all Plants, from the Cedar of Libanus, to the Mosse that groweth out of the Wall; And of all things that have Life and Motion. This maketh me thinke, that our King finding himselfe to Symbolize, in many things, with that King of the Hebrewes (which lived many yeares before him) honoured him with the Title of this Foundation. And I am the rather induced to be of this Opinion, for that I finde in ancient Records, this Order or Society is sometimes called Salomons House; And sometimes the Colledge of the Sixe Dayes Workes; whereby I am satisfied, That our Excellent King had learned from the Hebrewes, That GOD had created the World, and all that therein is, within sixe Dayes; And therefore he instituting that House, for the finding out of the true Nature of all Things (whereby GOD mought have the more Glory in the Workmanship of them, and Men the More fruit in the Use of them,) did give it also that second Name. But now to come to our present purpose. When the King had forbidden, to all his People, Navigation



gation into any Part, that was not under his Crowne, hee made nevertheless this Ordinance; That every twelve yeares there should be set forth, out of this Kingdome, two Ships, appointed to severall Voyages; That in either of these Ships, there should be a Mission of three of the Fellowes, or Brethren of Salomons House; whose Errand was onely to give us Knowledge of the Affaires and State of those Countries, to which they were designed; And especially of the Sciences, Arts, Manufactures, and Inventions of all the World; And withall to bring unto us, Bookes, Instruments, and Patternes, in every kinde: That the Shippers, after they had landed the Brethren, should returne; And that the Brethren should stay abroad till the new Mission, The Ships are not otherwise fraught, than with Store of Victuals, and good Quantity of Treasure to remaine with the Brethren, for the buying of such Things, and rewarding of such Persons, as they should thinke fit. Now for me to tell you, how the Vulgar sort of Marriners are contained from being discovered at Land; And how they that must be put on shore for any time, colour themselves under the Names of other Nations; And to what places these Voyages have beene designed; And what places of Rendezvous are appointed for the new Missions; And the like circumstances of the Practique; I may not doe it; Neither is it much to your desire. But thus you see, we maintaine a Trade, not for Gold, Silver, or Jewels; Nor for Silks; Nor for Spices; Nor any other Commodity of Matter; But onely for Gods first Creature, which was Light: To have Light (I say) of the Growth of all Parts of the World. And when hee had said this, he was silent; And so were we all. For indeed we were all astonished, to heare so strange things so probably told. And he perceiving that we were willing to say somewhat, but had it not ready, in great Courtesie tooke us off, and descended to aske us Questions of our Voyage and Fortunes, and in the end concluded, that we mought doe well, to thinke with our selves, what time of stay we would demand of the State; And bade us not to scant our selves; For he would procure such time as we desired. Whereupon we all rose up and presented our selves to kisse the skirt of his Tippet, but he would not suffer us; and so tooke his leave. But when it came once amongst our People, that the State used to offer Conditions to Strangers, that would stay, we had worke enough to get any of our Men to looke to our Ship; And to keep them from going presently to the Governour, to crave conditions. But with much adoe wee refrained them, till we mought agree what course to take.

We



We tooke our selves now for free men, seeing there was no danger of our utter Perdition; And lived most joyfully, going abroad, and seeing what was to bee seene, in the Citie and places adjacent, within our *Tedder*; And obtaining acquaintance with many of the Citie, not of the meanest Qualitie; At whose hands we found such Humanitie, and such a freedome and desire to take Strangers, as it were, into their Bosome, as was enough to make us forget all that was deare to us, in our owne Countries: And continually we met with many things, right worthy of Observation, and Relation: As indeed, if there bee a Mirrour in the World, worthy to hold Mens Eyes, it is that Countrey. One day there were two of our Company bidden to a *Feast* of the *Family*, as they call it. A most Naturall, Pious, and Reverend Custome it is, shewing that Nation to be compounded of all Goodnesse. This is the manner of it. It is granted to any Man, that shal live to see thirty Persons, descended of his Body, alive together, and all above three yeares old, to make this *Feast*, which is done at the cost of the State. The *Father* of the *Family*, whom they call the *Tirsan*, two dayes before the *Feast*, taketh to him three of such Friends as he liketh to chuse, And is assisted also by the Governour of the Citie, or Place, where the *Feast* is celebrated; And all the *Persons* of the *Family*, of both Sexes, are summoned to attend him. These two dayes the *Tirsan* sitteth in Consultation, concerning the good Estate of the *Family*. There, if there be any Discord or Sutes betweene any of the *Family*, they are compounded and appeased. There, if any of the *Family* be distressed or decayed, order is taken for their Reliefe, and competent meanes to live. There, if any bee subject to vice, or take ill Courses, they are reprov'd, and Censured. So likewise, Direction is given touching Marriages, and the courses of life, which any of them should take, with divers other the like Orders and Advises. The Governour assisteth, to the end, to put in Execution, by his Publike Authority, the Decrees and Orders of the *Tirsan*, if they should be disobeyed; Though that seldome needeth; Such Reverence and Obedience they give, to the Order of Nature. The *Tirsan* doth also then, ever chuse one Man from amongst his Sonnes, to live in House with him: Who is called, ever after, the *Sonne of the Vine*. The Reason will hereafter appeare. On the *Feast* day, the *Father*, or *Tirsan* commeth forth after Divine Service, into a large Roome, where the *Feast* is celebrated; Which Roome hath an Halfe-



Pace at the upper end. Against the wall, in the middle of the Half-Pace, is a Chaire placed for him, with a Table and Carpet before it. Over the Chaire is a State, made Round or Ovall, and it is of Ivy; An Ivy somewhat whiter than ours, like the Leafe of a Silver Aspe, but more shining; For it is greene all winter. And the State is curiously wrought with Silver and Silke of divers Colours, broiding or binding in the Ivy; And is ever of the worke, of some of the Daughters of the Family; And vailed over at the Top, with a fine Net of Silk and Silver. But the Substance of it is true Ivy; whereof, after it is taken downe, the Friends of the Family are desirous to have some Leafe or Sprig to keep. The *Tirfan* commeth forth with all his Generation or Linage, the Males before him, and the Females following him; And if there bee a Mother, from whose Body the Whole Linage is descended, there is a Traverse placed in a Loft above on the right hand of the Chaire, with a privy Dore, and a carved Window of Glasse, leaded with Gold and Blew; Where she sitteth, but is not seene. When the *Tirfan* is come forth, he sitteth downe in the Chaire; And all the Linage place themselves against the Wall, both at his Backe, and upon the Returne of the Halfe-pace, in Order of their yeares, without difference of Sex, and stand upon their Feet. When he is set, the Roome being alwayes full of Company; but well kept, and without Disorder; after some pause there commeth in from the lower end of the Roome, a *Taratan*, (which is as much as an *Herald*,) And on either side of him two *young Lads*; Whereof one carrieth a Scrowle of their shining yellow Parchment; And the other a cluster of Grapes of Gold, with a long Foot or Stalke. The *Herald*, and *Children*, are clothed with Mantles of Sea-water greene Sattin; But the *Heralds* Mantle is streamed with Gold, and hath a Traine. Then the *Herald* with three Curtesies, or rather Inclinations, commeth up as farre as the Halfe-pace; And there first taketh into his Hand the Scrowle. This Scrowle is the *Kings Charter*, containing Gift of Revenew, and many Privileges, Exemptions, and Points of Honour, granted to the *Father* of the *Family*; And it is ever stiled and directed; *To such an one, Our welbeloved Friend and Creditour*: Which is a Title proper onely to this Case. For they say, the King is Debter to no Man, but for Propagation of his Subjects, The Seale set to the *Kings Charter*, is the Kings Image, Imbossed or moulded in Gold; And though such *Charters* be expedited of Course, and



as of Right, yet they are varied by discretion, according to the Number and Dignitie of the *Family*. This *Charter* the *Herald* readeth aloud; And while it is read, the *Father* or *Tirfan*, standeth up, supported by two of his *Sonnes*; such as he chooseth. Then the *Herald* mounteth the Halfe-Pace, and delivereth the *Charter* into his Hand: And with that there is an Acclamation, by all that are present, in their Language, which is thus much; *Happy are the People of Bensalem*. Then the *Herald* taketh into his Hand from the other *Childe*, the Cluster of Grapes, which is of Gold; Both the Stalke; and the Grapes. But the Grapes are daintily enamelled; And if the Males of the *Family* be the greater number, the Grapes are enamelled Purple, with a little Sunne set on the Top; If the Females, then they are enamelled into a greenish yellow, with a Cressant on the Top. The Grapes are in number as many as there are Descendants of the *Family*. In his Golden Cluster, the *Herald* delivereth also to the *Tirfan*; who presently delivereth it over, to that Sonne, that he had formerly chosen, to be in House with him: Who beareth it before his *Father*, as an Ensigne of Honour, when he goeth in publike ever after; And is thereupon called *the Sonne of the Vine*. After this Ceremony ended, the *Father* or *Tirfan* retireth; And after some time commeth forth againe to Dinner, where hee sitteth alone under the State, as before; And none of his Descendants sit with him, of what Degree or Dignity so ever, except he hap to be of *Salomons House*. He is served onely by his owne Children, such as are Male; who performe unto him all service of the Table upon the knee; And the Women onely stand about him, leaning against the wall. The Roome below his Halfe-pace, hath Tables on the sides for the Guests that are bidden; Who are served with great and comely order; And towards the end of Dinner (which in the greatest Feasts with them, lasteth never above an Houre and a half) there is an *Hymne* sung, varied according to the Invention of him that composeth it; (for they have excellent Poetrie,) But the Subject of it is (alwayes) the praises of *Adam*, and *Noah*, and *Abraham*; Whereof the former two Peopled the World, and the last was the *Father* of the Faithfull: concluding ever with a Thanksgiving for the *Nativity* of our *Saviour*, in whose Birth, the Births of all are onely Blessed. Dinner being done, the *Tirfan* retireth againe; And having withdrawne himselfe alone into a place; where he maketh some private Prayers, he commeth forth the third time, to give the Blessing;



sing; with all his Descendants, who stand about him as at the first. Then he calleth them forth by one and by one, by name, as he pleaseth, though seldome the Order of Age bee inverted. The person that is called, (the Table being before removed,) kneeleth down before the Chair, and the Father layeth his Hand upon his Head, or her Head, and giveth the Blessing in these words; *Sonne of Bensalem, (or Daughter of Bensalem,) thy Father saith it; The Man by whom thou hast Breath and Life speaketh the word; The Blessing of the Everlasting Father, the Prince of Peace, and the Holy Dove be upon thee, and make the dayes of thy Pilgrimage good and many.* This he saith to every of them; And that done, if there be any of his Sonnes, of eminent Merit and Vertue, (so they be not above two,) he calleth for them againe; and saith, laying his Arme over their shoulders, they standing; *Sonnes, it is well you are borne, give God the praise, and persevere to the end.* And withall delivereth to either of them a Jewell, made in the Figure of an Eare of Wheate, which they ever after weare in the front of their Turban, or Hatt. This done, they fall to Musicke and dances, and other recreations, after their manner, for the rest of the day. This is the full order of that Feast.

By that time, six or seven Dayes were spent, I was fallen into straight Acquaintance, with a *Merchant* of that *Citie*, whose Name was *Joabin*. He was a *Jew* and *Circumcised*: For they have some few stirps of *Jewes*, yet remaining among them, whom they leave to their owne Religion. Which they may the better doe, because they are of a farre differing Disposition from the *Jewes* in other Parts. For whereas they hate the Name of *CHRIST*; and have a secret inbred Rancour against the People amongst whom they live; these (contrariwise) give unto our *SAVIOR* many high Attributes, and love the *Nation of Bensalem*, extremely. Surely this Man, of whom I speake, would ever acknowledge, that *CHRIST* was borne of a *Virgin*; and that he was more than a Man; And he would tell how *GOD* made him Ruler of the *Seraphims*, which guard his Throne; And they call him also the *Milken Way*, and the *Eliab* of the *Messiah*; and many other High Names; which though they be Inferiour to his Divine Majesty, yet they are farre from the Language of other *Jewes*. And for the Countrey of *Bensalem*, this Man would make no end of commending it, Being desirous by Tradition among the *Jews* there, to have it beleaved, that the Peo-



ple thereof were of the Generations of *Abraham*, by another Sonne, whom they call *Nachoran*; And that *Moses* by a secret *Cabala* ordained the Lawes of *Bensalem* which they now use; And that when the *Messias* should come, and sit in his Throne at *Hierusalem*, the King of *Bensalem*, should sit at his feet, whereas other Kings should keepe a great distance. But yet setting aside these *Iewish* Dreames, the Man was a wise Man, and learned, and of great Policy, and excellently seene in the Lawes and Customes of that Nation. Amongst other Discourses, one day, I told him, I was much affected with the Relation I had, from some of the Company, of their Custome, in holding the *Feast* of the *Family*; For that (me thought) I had never heard of a Solemnity, wherein Nature did so much preside. And because Propagation of Families, proceedeth from the Nuptiall Copulation, I desired to know of him, what Lawes and Customes they had concerning Marriage; and whether they kept Marriage well; and whether they were tyed to one Wife? For that where Population is so much affected, and such as with them it seemed to bee, there is commonly Permission of *Plurality* of *Wives*. To this he said; *You have Reason for to commend that excellent Institution of the Feast of the Family; And indeed we have Experience, that those Families that are partakers of the Blessings of that Feast, doe flourish and prosper ever after, in an extraordinary manner. But hear me now, and I will tell you what I know. You shall understand, that there is not under the Heavens so chaste a Nation, as this of Bensalem, Nor so free from all Pollution or foulness. It is the Virgin of the World, I remember, I have reade in one of your Europæan Bookes, of an holy Hermit amongst you, that desired to see the Spirit of Fornication, and there appeared to him, a little foule ugly Aethiope: But if hee had desired to see the Spirit of Chastitie of Bensalem, it would have appeared to him, in the likeness of a faire beautifull Cherubine. For there is nothing amongst Mortall Men, more faire and admirable, than the Chaste Mindes of this People. Know therefore, that with them there are no Stewes, no dissolute Houses, no Curtisans, nor any thing of that kinde. Nay they wonder (with detestation) at you in Europe, which permit such things. They say ye have put Marriage out of office: For Marriage is ordained a Remedie for unlawfull Concupiscence; And Naturall Concupiscence seemeth as a spurre to Marriage. But when Men have at hand a Remedy, more agreeable to their corrupt will, Marriage is almost expulsed. And therefore there are with you seene*  
*infinite*



infinite Men, that marry not, but chuse rather a libertine and impure single Life, than to bee yoked in Marriage; And many that doe marry, marry late, when the Prime and Strength of their Yeares is past. And when they doe marry, what is Marriage to them, but a very Bargaine; Wherein is sought Alliance, or Portion, or Reputation, with some desire (almost indifferent) of Issue; And not the faithfull Nuptiall Vnion of Man and Wife, that was first instituted. Neither is it possible, that those that have cast away so basely, so much of their Strength, should greatly esteeme Children, (being of the same Matter,) as chaste Men doe. So likewise during Marriage is the Case much amended, as it ought to be if those things were tolerated onely for necessitie; No, but they remaine still as a very Affront to Marriage. The Haunting of those dissolute places, or resort to Curtexians, are no more punished in Married Men, than in Batchelers. And the depraved Custome of Change, and the delight in Meretricious Embracements, (where sinne is turned into Art,) maketh marriage a dull thing, and a kinde of Imposition, or Taxe. They heare you defend these things; as done to avoid greater Evills; As Advoutries, Deflowering of Virgins, Vmmaturall lust, and the like. But they say, this is a preposterous Wisdome; And they call it Lots offer, who to save his Guests from abusing, Offered his Daughters. Nay they say further, That there is little gained in this; For that the same Vices and Appetites, doe still remaine and abound. Unlawfull Lust being like a Furnace, that if you stop the Flames altogether, it will quench; But if you give it any vent, it will rage; As for Masculine Love, they have no touch of it; And yet there are not, so faithfull and inviolate Friendships, in the world againe, as are there; And to speake generally, (as I said before,) I have not read of any such Chastitie, in any People, as theirs. And their usuall saying is, That whosoever is unchaste cannot reverence himselfe: And they say, That the reverence of a Mans selfe, is, next Religion, the chiefeest bridle of all Vices. And when he had said this, the good Jew paused a little; Whereupon, I farre more willing to heare him speake on, than to speake my selfe; yet thinking it decent, that upon his pause of Speech, I should not be altogether silent, said onely this; That I would say to him, as the Widow of Sarepta said to Elias; That hee was come to bring to Memorie our Sinnes; And that I confesse the Righteousnesse of Bensalem, was greater than the Righteousnesse of Europe. At which speech he bowed his Head, and went on this manner. They have also many wise and excellent Lawes touching Marriage.



They allow no Polygamie. They have ordained that none doe inter-marry, or contract, untill a Moneth be past from their first inter-view. Marriage without consent of Parents they doe not make void, but they mulkt it in the Inheritors: For the Children of such Marriages, are not admitted to inherit, above a third Part of their Parents Inheritance. I have read in a Book of one of your Men, of a Feigned Common-wealth, where the Married couple are permitted, before they Contract, to see one another Naked. This they dislike: For they think it a Scorne, to give a Refusall after so familiar Knowledge: But because of many hidden Defects in Men and Womens Bodies, they have a more Civill way: for they have neare every Towne, a Couple of Pooles, (which they call Adam and Eves Pooles,) where it is permitted to one of the friends of the Man, & another of the friends of the Woman, to see them severally bath Naked.

And as wee were thus in Conference, there came one that seemed to bee a Messenger, in a rich Huke, that spake with the Jew: whereupon he turned to me, and said; *You will pardon me, for I am commanded away in haste.* The next Morning hee came to me againe, joyfull, as it seemed, and said; *There is word come to the Governour of the Citie, that one of the Fathers of Salomons House, will be here this day Seven-night: Wee have seene none of them this Dozen Yeares. His Comming is in State; But the cause of his Comming is secret. I will provide you, and your Fellowes, of a good Standing to see his Entry.* I thanked him, and told him; *I was most glad of the Newes.* The day being come he made his Entry. He was a Man of middle Stature, and Age, comely of Person, and had an Aspect as if he pittied Men. He was cloathed in a Roabe of fine blacke Cloth, with wide Sleeves, and a Cape. His under Garment was of excellent white Linnen, downe to the Foot, girt with a girdle of the same; And a Sindon or Tip-pet of the same about his Neck. Hee had Gloves, that were curious, and set with Stone; And Shoes of Peach-coloured Velvet. His Necke was bare to the Shoulders. His Hat was like a Helmet, or *Spanish Montera*; And his locks curled below it decently: They were of Colour browne. His Beard was cut round, and of the same colour with his Haire, somewhat lighter. Hee was caried in a rich Charriot, without wheelles, Litter-wise, With two Horses at either end, richly trapped in blew Velvet Embroydered; and two Footmen on each side in the like Attire. The Charriot was all of Cedar, gilt and adorned with Chrystall; Save that the Fore-end had



Pannells of Sapphires, set in Borders of Gold, and the Hinder-end the like of Emeralds of the *Peru* Colour. There was also a Sunne of Gold, Radiant upon the Top, in the Midst; And on the Top before, a small *Cherub* of Gold, with Wings displayed. The Charriot was covered with Cloth of Gold tissued upon Blew. He had before him fifty Attendants, young Men all, in white *Satten* loose Coats to the Mid Leg, and Stockings of white Silk; and Shoos of blew Velvet; and Hats of blew Velvet; with fine Plumes of divers Colours, set round like Hatbands. Next before the Charriot, went two Men, bare headed, in Linnen Garments downe to the foot, girt, and Shoes of blew Velvet, who carried the one a Crosier, the other a Pastorall Staffe, like a Sheep-hooke; Neither of them of Metall, but the Crosier of Balme-wood, the Pastorall Staffe of Cedar. Horsemen hee had none, neither before, nor behind his Charriot: As it seemeth, to avoid all Tumult and Trouble. Behinde his Charriot, went all the Officers and Principals of the Companies of the Citie. He sate alone, upon Cushions, of a kinde of excellent Plush, blew; And under his Foot curious Carpets of Silke of divers Colours, like the Persian, but farre finer. He held up his Bare Hand, as he went, as blessing the people, but in Silence. The Street was wonderfully well kept; So that there was never any Army had their Men stand in better Battell-Array, than the People stood. The Windowes likewise were not crouded, but every One stood in them, as if they had beene placed. When the shew was past, the *Jew* said to mee; *I shall not be able to attend you as I would, in regard of some Charge the Citie hath layd upon me, for the Entertaining of this Great Person.* Three dayes after the *Jew* came to me againe, and said; *Ie are happy Men; For the Father of Salomons House taketh knowledge of your Being here, and commanded me to tell you, that he will admit all your Company to his presence, and have private Conference with one of you, that yee shall choose: And for this hath appointed the next day after to Morrow. And because he meaneth to give you his Blessing, hee hath appointed it in the Fore-Noone.* Wee came at our Day, and Houre, and I was chosen by my Fellowes for the private Accessse. We found him in a faire Chamber, richly hanged, and carpetted under Foot, without any Degrees to the State, he was set upon a Low Throne richly adorned, and a rich cloth of State over his Head, of Blew *Sattin* Embroidered. He was alone, save that hee had two Pages of Honour, on either Hand one, finely attired in White.



White. His Under Garments were the like that wee saw him weare in the Chariot; But in stead of his Gowne, he had on him a Mantle with a Cape, of the same fine Blacke, fastned about him. When wee came in, as we were taught, we bowed Low at our first Entrance; And when wee were come neare his Chaire, he stood up, holding forth his Hand ungloved, and in Posture of Blessing; And we every one of us stooped downe, and kissed the Hemme of his Tippet. That done, the rest departed, and I remained. Then he warned the Pages forth of the Roome, and caused me to sit downe beside him, and spake to me thus in the Spanish Tongue.

**G**OD blesse thee, my Sonne; I will give thee the greatest Jewell I have. For I will impart unto thee, for the love of GOD and Men, a Relation of the true State of Salomons House. Sonne, to make you know the true state of Salomons House, I will keepe this order. First I will set forth unto you the End of our Foundation. Secondly, the Preparations and Instruments we have for our VVorks. Thirdly, the severall Employments and Functions whereto our Fellowes are assigned. And fourthly the Ordinances and Rites which wee observe.

The End of our Foundation is the Knowledge of Causes, and Secret Motions of Things; and the Enlarging of the bounds of Humane Empire, to the Effecting of all Things possible.

The Preparations and Instruments are these. We have large and deep Caves of several Depths: The deepest are sunke 600. Fathome: And some of them are digged and made under great Hills and Mountaines: So that if you reckon together the  
Depth



Depth of the Hill, and the Depth of the Cave, they are (some of them) above three Miles deep. For we finde, that the Depth of an Hill, and the Depth of a Cave from the Flat, is the same Thing; both remote alike, from the Sunne and Heavens Beames, and from the open Aire. These Caves we call the Lower Region. And wee use them for all Coagulations, Indurations, Refrigerations, and Conservations, of Bodies. We use them likewise for the Imitation of Naturall Mines; And the Producing also of New Artificiall Mettals, by Compositions and Materials which we use & lay there for many yeares. We use them also sometimes, (which may seeme strange) for Curing of some Diseases, and for Prolongation of Life, in some Hermits that choose to live there, well accommodated of all things necessary, and indeed live very long; By whom also we learne many things.

We have Burialls in severall Earths, where we put divers Cements, as the Chineses, doe their Porcellane. But we have them in greater Varietie, and some of them more fine. We also have great variety of Composts, and Soiles, for the Making of the Earth Fruitfull.

We have High Towers; The Highest about halfe a Mile in Height; And some of them likewise set upon High Mountaines: So that the Vantage of the Hill with the Tower, is in the Highest of them three Miles at least. And these Places we call the Vpper Region; Accounting the Aire betweene the High Places, and the Low, as a Middle Region. We use these Towers, according to their severall Heights, and Situations, for Infolation,



tion, Refrigeration, Conservation, *And for the View of divers Meteors; As VVindes, Raine, Snow, Haile; And some of the Fiery Meteors also. And upon them, in some Places, are Dwellings of Hermits, whom we visit sometimes, and instruct what to observe.*

*We have great Lakes both Salt, and Fresh, whereof we have use for the Fish, and Fowle. We use them also for Burialls of some Naturall Bodies: For wee finde a difference in Things buried in Earth, or in Aire below the Earth, and things buried in VVater. We have also Pooles, of which some doe straine Fresh VVater out of Salt; And others by Art doe turne Fresh VVater into Salt. We have also some Rocks in the Midst of the Sea; And some Bayes upon the Shore for some Works, wherein is required the Aire and Vapour of the Sea. We have likewise violent Streames and Cataracts, which serve us for many Motions: And likewise Engines for Multipling and Enforcing of Windes, to set also on going divers Motions.*

*We have also a Number of Artificiall Wells, and Fountaines, made in Imitation of the Naturall Sources and Bathes; As tinted upon Vitrioll, Sulphur, Steele, Brasse, Lead, Nitre, and other Mineralls. And againe, wee have little Wells for Infusions of many Things, where the Waters take the Vertue quicker and better, than in Vessels, or Basins. And amongst them we have a Water, which we call vvater of Paradise, being, by that we doe to it, made very Sovereaigne for Health, and Prolongation of Life.*

*WVe*



*We have also Great and spacious Houses, where we imitate and demonstrate Meteors; As Snow, Haile, Raine, some Artificiall Raines of Bodies, and not of Water, Thunders, Lightnings; Also Generations of Bodies in Aire; As Frogs, Flies, and diverse Others.*

*We have also certaine Chambers, which we call Chambers of Health, where we qualifie the Aire as we thinke good and proper for the Cure of divers Diseases, and Preservation of Health.*

*We have also faire and large Baths, of severall Mixtures, for the Cure of Diseases, and the Restoring of Mans Body from Arefaction: And Others for the Confirming of it in Strength of Sinews, Vitall Parts, and the very Juyce and Substance of the Body.*

*We have also large and various Orchards, and Gardens, Wherein we do not so much respect Beauty, as Variety of Ground and Soile, proper for divers Trees, and Herbes: And some very spacious, where Trees and Berries are set, whereof we make divers Kindes of Drinks, besides the Vine-yards. In these we practise likewise all Conclusions of Grafting, and Inoculating, as well of Wilde-Trees, as Fruit-Trees, which produceth many Effects. And we make (by Art) in the same Orchards, and Gardens, Trees and Flowers, to come earlier or later than their Seasons; And to come up and beare more speedily than by their Naturall Course they doe. Wee make them also by Art greater much than their Nature; And their Fruit greater, and sweeter, and of differing Taste, Smell, Colour, and Figure, from their Nature. And many of them we so*  
e Order



Order as that they become of Medicinall Use.

We have also Meanes to make divers Plants, rise by Mixtures of Earths without Seeds; And likewise to make divers New Plants, differing from the Vulgar; and to make one Tree or Plant turne into another.

We have also Parkes, and Enclosures of all Sorts, of Beasts, and Birds; which we use not onely for View or Rarenesse, but likewise for Dissections, and Trials; That thereby may take light, what may be wrought upon the Body of Man. Wherein wee finde many strange Effects; As Continuing Life in them, though divers Parts, which you account Vitall, be perished, and taken forth; Resuscitating of some that seeme Dead in Appearance; And the like. We try also all Poysons, and other Medicines vpon them, as well of Chirurgery, as Physicke. By Art likewise, we make them Greater, or Taller, than their Kinde is; And contrary-wise Dwarfe them and stay their Growth: Wee make them more Fruitfull, and Bearing than their Kinde is; And contrary-wise Barren and not Generative. Also we make them differ in Colour, Shape, Activity, many wayes. We finde Meanes to make Commixtures & Copulations of diverse Kindes, which have produced many New Kinds, and them not Barren, as the generall Opinion is. We make a number of Kindes, of Serpents, Wormes, Flies, Fishes, of Putrefaction; wherof some are advanced (in effect) to be Perfect Creatures, like Beasts, or Birds; And have Sexes, and doe Propagate. Neither do we this by Chance, but we know before hand, of what Matter and Commixture, what



*what Kinde of those Creatures, will arise.*

*We have also Particular Pools, where we make Trialls upon Fishes, as wee have said before of Beasts and Birds.*

*We have also Places for Breed and Generation of those Kindes of Wormes, and Flies, which are of Speciall Use; such as are with you your Silkwormes, and Bees.*

*I will not hold you long with recounting of our Brew-houses, Bake-houses, and Kitchens, where are made divers Drinkes, Breads, and Meats, Rare and of speciall Effects. Wines wee have of Grapes; And Drinkes of other Juyce, of Fruits, of Graines, and of Rootes; And of Mixtures with Honey, Sugar, Manna, and Fruits dried and decocted: Also of the Teares or Woundings of Trees; And of the Pulp of Canes. And these Drinks are of Severall Ages, some to the Age or Last of forty yeares. We have Drinks also brewed with severall Herbs, and Roots, and Spices; Yea, with severall Fleshes, and White-Meats; whereof some of the Drinkes are such as they are in effect Meat and Drinke both: So that Divers, especially in Age, doe desire to live with them, with little or no Meat, or Bread. And above all we strive to have Drinks of Extreame Thinne Parts; To insinuate into the Body, and yet without all Biting, Sharpnesse, or Fretting; Insomuch as some of them put upon the Back of your Hand, will, with a little stay passe thorow to the Palme, and yet taste Mild to the Mouth. We have also Waters, w<sup>ch</sup> wee ripen in that fashion, as they become Nourishing; So that they are indeed excellent Drinke;*



*And many will use no other. Breads we have of Severall Graines, Roots, and Kernels; Yea, and some of Flesh, and Fish, Dried; With divers kinds of Leavings, and Seasonings: So that some doe extreamely move Appetites; Some doe nourish so, as Divers doe live of them, without any other Meat; Who live very long. So for Meats, wee have some of them so beaten, and made tender, and mortified, yet without all Corrupting, as a Weake Heat of the Stomacke will turne them into good Chilus; As well as a Strong Heat would Meat otherwise prepared. We have some Meats also, and Breads, and Drinkes, which taken by Men, enable them to Fast long after; And some other, that used make the very Flesh of Mens Bodies, sensibly more Hard and Tough; And their Strength farre greater, than otherwise it would be.*

*We have Dispensatories, or Shops of Medicines. Wherein you may easily thinke, if we have such Varietie of Plants, and Living Creatures, more than you have in Europe, (for we know what you have,) the Simples, Drugges, and Ingredients of Medicines, must likewise be in so much the greater Varietie. We have them likewise of divers Ages, and long Fermentations. And for their Preparations, wee have not onely all Manner of Exquisite Distillations, and Separations, and especially by Gentle Heats, and Percolations through divers Strainers, yea, and Substances; But also exact Formes of Composition, whereby they incorporate almost as they were Naturall Simples.*

*We have also divers Mechanicall Arts, which*  
you



*you have not; And Stuffles made by them; As Papers, Linnen, Silkes, Tissues; dainty Workes of Feathers of wonderfull Lustre; excellent Dies, and manie others: And Shops likewise as well for such as are not brought into Vulgar use amongst us, as for those that are. For you must know, that of the Things before recited, manie of them are growne into use throughout the Kingdome; But yet, if they did flow from our Invention, we have of them also for Patternes, and Principalls.*

*We have also Fournaces of great Diversities, and that keepe great Diversitie of Heats: Fierce and Quicke; Strong and Constant; Soft and Milde; Blowne, Quiet, Drie, Moist; And the like. But above all we have Heats, in Imitation of the Sunnes and Heavenly Bodies Heats, that passe divers Inequalities, and (as it were) Orbs, Progresses, and Returnes, whereby wee produce admirable effects. Besides, wee have Heats of Dunges; and of Bellies and Mawes of Living Creatures and of their Bloods, and Bodies; and of Hayes and Herbs laid up moist; of Lime unquenched, and such like. Instruments also which generate Heate onely by Motion. And further, Places for Strong Insolations; And againe, Places under the Earth, which by Nature, or Art, yeeld Heate. These divers Heats wee use, As the Nature of the Operation, which wee intend, requireth.*

*Wee have also Perspective-Houses, where we make Demonstrations of all Lights, and Radiations: And of all Colours: And out of Things uncoloured and Transparent, we can represent un-*



*to you all severall Colours; Not in Rain-bowes, (as it is in Gemmes, and Prismes,) but of themselves Single. We represent also all Multiplications of Light, which we carry to great Diltance: and make so Sharpe, as to discern small Points and Lines. Also all Colourations of Light. All Delusions and Deceits of the Sight, in Figures, Magnitudes, Motions, Colours: All Demonstrations of Shadowes. Wee finde also divers Meanes yet unknowne to you, of Producing of Light, originally, from divers Bodies. We procure meanes of Seeing Objects A-farre off; As in the Heaven, and Remote Places: And represent Things Neare as A-farre off; And Things A-farre off as Neare; Making Faigned Distances. Wee have also Helpes for the Sight, farre above Spectacles and Glasses in use. Wee have also Glasses and Means, to see Small and Minute Bodies, perfectly and distinctly; As the Shapes and Colours of Small Flies and Wormes, Graines, and Flawes, in Gemmes, which cannot otherwise be seene, Observations in Vrine and Bloud not otherwise to be seene. VVe make Artificiall Rain-Bowes, Halo's, and Circles about Light. VVe represent also all manner of Reflexions, Refractions, and Multiplications of Visuall Beames of Objects.*

*We have also Pretious Stones, of all kindes, many of them of great Beautie and to you unknown: Christalls likewise; And Glasses of divers kinds; And amongst them some of Metals Vitrificated, and other Materialls, besides those of which you make Glasse. Also a Number of Fossiles, and Im-*  
perfect



perfect Mineralls, which you have not. Likewise Loadstones of Prodigious Vertue: And other rare Stones, both Naturall and Artificiall.

Wee have also Sound-houses, where we practise and demonstrate all Sounds, and their Generation. We have Harmonies which you have not, of Quarter-Sounds, and lesser Slides of Sounds. Diverse Instruments of Musicke likewise to you unknowne, some sweeter than any you have; Together with Bells and Rings that are dainty and sweet. Wee represent small sounds as great and Deepe; Likewise Great sounds, Extenuate and sharpe; Wee make diverse tremblings and Warblings of sounds, which in their Originall are Entire. Wee represent and imitate all Articulate sounds and Letters, and the Voices and Notes of Beasts and Birds. Wee have certaine Helps, which set to the Eare doe further the Hearing greatly. Wee have also diverse strange and Artificiall Echo's, Reflecting the Voice many times, and as it were tossing it: And some that give backe the Voice Lowder than it came, some shriller, and some Deeper; Yea some rendring the Voice, Differing in the Letters or Articulate Sound, from that they receive. Wee have also meanes to convey sounds in Trunks and Pipes, in strange Lines and Distances.

Wee haue also Perfume-houses; wherewith we joyne also Practises of Taste. Wee Multiply smells, which may seeme strange. Wee Imitate smells, making all smells to breath out of other Mixtures than those that give them. Wee make diverse Imitations of Taste likewise, so that they will



will deceive any Mans Taste. And in this House we containe also a Confiture-House; where we make all Sweet-Meats, Drie and Moist; And divers pleasant Wines, Milks, Broaths, and Sallets, farre in greater Varietie than you have.

We have also Engine-Houses, where are prepared Engines and Instruments for all Sorts of Motions. There we imitate and practise to make Swifter Motions, than any you have, either out of your Muskets, or any Engine that you have: And to Make them, and Multiply them more Easily, and with Small Force, by Wheeles, and other Meanes: And to make them Stronger, and more Violent, than yours are; Exceeding your greatest Cannons and Basilisks. Wee represent also Ordnance and Instruments of Warre, and Engines of all Kinde: And likewise New Mixtures and Compositions of Gunne-Powder, Wilde-Fires burning in VVater, and Unquenchable. Also Fire-workes of all Varietie both for Pleasure, and Vse. Wee imitate also Flights of Birds; VVe have some Degrees of Flying in the Ayre. VVe have Ships and Boats for Going under VVater, and Brooking of Seas; Also Swimming-Girdles and Supporters. VVe have divers curious Clocks; And other like Motions of Returne: And some Perpetuall Motions. We imitate also Motions of Living Creatures, by Images of Men, Beasts, Birds, Fishes, and Serpents; We have also a great Number of other Various Motions, strange for Equality, Finenesse, and Subtilty.

We have also a Mathematicall-House, where  
are







Liberall Sciences; And also of practises which are not Brought into Arts. These we call Mystery-men.

We have three that trie New Experiments, Such as themselves thinke good. These we call Pioners or Miners.

We have Three that Draw the Experiments of the Former Foure into Titles, and Tables, to give the better light for the drawing of Observations and Axiomes out of them. These wee call Compilers.

Wee have Three that bend themselves, Looking into the Experiments of their Fellowes, and cast about how to draw out of them Things of Use, and Practise for Mans life, and Knowledge, as well for Workes as for Plaine Demonstration of Causes, Meanes of Naturall Divinations, and the easie and cleare Discoverie of the Vertues and Parts of Bodies. These wee call Dowry-men or Benefactors.

Then after diverse Meetings and Consults of our whole Number, to consider of the former Labours and Collections, we have Three that take care out of them to Direct New Experiments, of a Higher Light, more Penetrating into Nature than the Former. These we call Lamps.

We have three others that doe Execute the Experiments so Directed, and Report them. These we call Inoculators.

Lastly, we have threethat raise the former Discoveries by Experiments, into Greater Observations, Axiomes, and Aphorismes. These wee call Interpreters of Nature.

Wee



*We have also, as you must thinke, Novices and Apprentices, that the Succession of the former Employed Men doe not faile; Besides a great Number of Servants and Attendants, Men and Women. And this we doe also: Wee have Consultations, which of the Inventions and Experiences, which we have discovered, shall be Published, and which not: And take all an Oath of Secrecie, for the concealing of those which we thinke fit to keepe Secret: Though some of those we doe reveale sometimes to the State, and some not.*

*For our Ordinances and Rites: We have two very Long, and Faire Galleries: In one of these wee place Patternes and Samples of all manner of the more Rare and Excellent Inventions: In the other wee place the Statuas of all Principall Inventours. There we have the Statua of your Columbus, that discovered the West-Indies: Also the Inventour of Shippes: Your Monke that was the Inventour of Ordnance, and of Gunpowder: The Inventour of Musicke: The Inventour of Letters: The Inventour of Printing: The Inventour of Observations of Astronomy: The Inventour of Works in Metall: The Inventour of Glasse: The Inventour of Silke of the Worme: The Inventour of Wine: The Inventour of Corne and Bread: The Inventour of Sugars: And all these, by more certaine Tradition, than you have. Then have wee divers Inventours of our Owne, of Excellent VVorkes; Which since*



you have not seene, it were too long to make Descriptions of them; And besides, in the right Understanding of those Descriptions, you might easily erre. For upon every Invention of Valew, we erect a Statua to the Inventour, and give him a Liberall and Honourable Reward. These Statua's are, some of Brasse; some of Marble and Touchstone; some of Cedar and other speciall Woods gilt and adorned; some of Iron; some of Silver; some of Gold.

Wee have certaine Hymnes and Services, which we say daily, of Laud and Thankes to God for his Marveilous Workes: And Formes of Prayers, imploring his Aide and Blessing, for the Illumination of our Labours, and the turning of them into Good and Holy Vses.

Lastly, we have Circuits or Visits, of divers Principall Cities of the Kingdome, where as it commeth to passe, we doe publish such New Profitable Inventions, as wee thinke good. And we doe also declare Naturall Divinations of Diseases, Plagues, Swarmes of Hurtfull Creatures, Scarcity, Tempests, Earthquakes, Great Inundations, Comets, Temperature of the Yeare, and divers other Things; And wee give Counsell thereupon, what the People shall doe, for the Prevention and Remedy of them.

And



And when He had said this, Hee stood up: And I, as I had beene taught, kneeled downe; and he laid his Right Hand upon my Head, and said; G O D blesse thee my Sonne, and G O D blesse this Relation, which I have made. I give thee leave to Publish it, for the good of other Nations; For we here are in G O D S Bosome, a Land unknowne. And so he left me; Having assigned a valew of about two Thousand Duckets, for a Bounty to me and my Fellowes. For they give great Largeesses, where they come, upon all occasions.

*The rest was not Perfected.*



The Mitigation of Paine.  
 The Encreasing of Strength and Activity.  
 The Encreasing of Ability to suffer Torment or Paine.  
 The Altering of Complexions: and Faintness, and Languish.  
 The Altering of Statures.  
 The Encreasing and Exalting of the Intellectual-  
 all Parts.  
 Versions of Bodies into other Bodies.  
 Making of New Species.  
 Transplanting of one Species into another.  
 Instruments of Destruction, as of VVarts and  
 Poxen.  
 Exhalation



And when he had said this, Hee stood up: And I had  
 about two Thousand Duckers, for a Bounty to me and my Fel-  
 lows: For they give great Launches, where they come.

# MAGNALIA NATVRÆ

## PRÆCIPUE QUOAD VSUS HUMANOS.



*The Prolongation of Life.*

*The Restitution of Youth in some Degree.*

*The Retardation of Age.*

*The Curing of Diseases counted Incurable.*

*The Mitigation of Paine.*

*More Easie and lesse Loathsome Purgings.*

*The Encreasing of Strength and Activity.*

*The Encreasing of Ability to suffer Torture or Paine.*

*The Altering of Complexions: and Fatnesse, and Leanness.*

*The Altering of Statures.*

*The Altering of Features.*

*The Encreasing and Exalting of the Intellectual all Parts.*

*Versions of Bodies into other Bodies.*

*Making of New Species.*

*Transplanting of one Species into another.*

*Instruments of Destruction, as of VVarre and Poison.*

Exhilaration



*Exhilaration of the Spirits, and Putting them in good Disposition.*

*Force of the Imagination, either upon another Body, or upon the Body it selfe.*

*Acceleration of Time in Maturations.*

*Acceleration of Time in Clarifications.*

*Acceleration of Putrefaction.*

*Acceleration of Decoction.*

*Acceleration of Germination.*

*Making Rich Composts for the Earth.*

*Impressions of the Aire, and Raising of Tempests.*

*Great Alteration; As in Induration, Emollition, &c.*

*Turning Crude and Watry Substances, into Oily and Uctious Substances.*

*Drawing of New Foods out of Substances not now in Use.*

*Making New Threds for Apparell; And New Stuffles, Such as are Paper, Glasse, &c.*

*Naturall Divinations.*

*Deceptions of the Senses.*

*Greater Pleasures of the Senses.*

*Artificiall Mineralls and Cements.*

*FINIS.*



# F I N I S

Artificial Minerals and Cements.  
 Greater Pleasures of the Senses.  
 Deceptions of the Senses.

Natural Divinations.

Stuffs, such as Paper, Glass, &c.

Making New Threads for Apparel; and New

Wool in Use.

Drawing of New Foods out of Substances not

Oil and Unguent Substances.

Turning Crude and Vary Substances, into

Oil, &c.

Great Alteration; As in Induration, Emolli-

ness.

Impressions of the Air, and Raising of Tem-

peratures Rich Composts for the Earth.

Acceleration of Germination.

Acceleration of Decoction.

Acceleration of Purification.

Acceleration of Time in Clarifications.

Acceleration of Time in Maturation.

Body, or upon the Body itself.

Force of the Imagination; either upon another

Good Disposition.

Exhalation of the Spirits, and Putting them in



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